### OPEN SESSION

3:30 **Consent Agenda**  
**Motion:** To approve or receive for information by consent items 2-6 below.

1. Minutes of the 20 November 2017 Meeting  
   Decision

2. Reports from Committees and Councils  
   a. Graduate & Research Council  
   b. Undergraduate Council  
   Information

3. Report of the President  
   a. Recognition and Commendation  
   Information

4. Report of the Vice-President, Academic & Provost  
   a. University Research Chairs  
   Information

5. Reports from the Faculties  
   Information

6. Committee Appointments  
   Decision

### Regular Agenda

3:35 7. Business Arising from the Minutes  
   Information

3:40 8. Teaching Presentation – Jason Grove, Chemical Engineering  
   Information

3:55 9. Reports from Committees and Councils  
   a. Executive Committee  
   Second Reading/Decision
   b. Joint Report from Graduate & Research Council and Undergraduate Council  
   Decision
   c. Graduate & Research Council  
   Decision
   d. Undergraduate Council  
   Decision

4:35 10. Report of the President  
   Information

4:45 11. Q&A Period with the President  
   Information

   Information

5:05 13. Report of the Vice-President, University Research  
   Information

   a. Changes to Faculty of Environment Constitution  
   Decision

5:25 15. Other Business

### CONFIDENTIAL SESSION

5:30 16. Minutes of the 20 November 2017 Meeting  
   Decision

5:35 17. Business Arising from the Minutes
<table>
<thead>
<tr>
<th>Time</th>
<th>Item</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>5:40</td>
<td>18. Report from Committee</td>
<td></td>
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<tr>
<td>5:40</td>
<td>a. Nominating Committee for Honorary Degrees</td>
<td>Decision</td>
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<tr>
<td>5:50</td>
<td>19. Other Business</td>
<td></td>
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22 December 2017
KJJ/ees
Karen Jack
University Secretary
University of Waterloo
SENATE
Minutes of the Monday 20 November 2017 Meeting

Present: Bilal Akhtar, Katherine Bergman, Antonio Brieva, Robert Bruce, Kofi Campbell, Claudio Canizares, Jeff Casello, Jennifer Clapp, Andrew Clubine, Mario Coniglio, Simon Courtenay, Shannon Dea, David DeVidi, George Dixon, Peter Douglas (dean of engineering pro tem), Tia Driver, Bernard Duncker, Fraser Easton, Marlene Epp, Paul Fieguth, Wendy Fletcher, George Freeman, Matthew Gerrits, Julia Goyal, Craig Hardiman, Feridun Hamdullahpur (chair), Dennis Huber, Marios Ioannidis, Karen Jack (secretary), Scott Kline, Robert Lemieux, Mungo Marsden, Katie Misener, Barb Moffatt, Bruce Muirhead (vice-president, university research pro tem), Mohammad Nasif, Cathy Newell Kelly, Angela Pereira**, Francis Poulin (dean of mathematics pro tem), Bruce Richter, James Rush, Mark Seasons, Marcus Shantz, Samantha Shortall, Richard Staines, Gordon Stubley, Bryan Tolson, Johanna Wandel, Ross Willard, Alexander Wray

Guests: Bruce Campbell, Donna Ellis, Jason Greatrex, Kelly Grindrod, Peggy Jarvie, Jennifer Kieffer, Andrea Kelman, Melissa Knox, Derek Madge, Diana Parry, Leanne Perreault, Ian Rowlands, Emily Schroeder, Daniela Seskar-Hencic, Allan Starr, Susan Tighe, Scott Walbridge, Olaf Weber, Glen Weppler


*regrets
**joined by telephone

OPEN SESSION

Consent Agenda
Senate heard a motion to approve or receive for information the items on the consent agenda. Senate understood that the Committee Appointments reports at members’ places (new item #5) was also under consideration in the consent report.

Bruce and Wray.

1. MINUTES OF THE 16 OCTOBER 2017 MEETING
Senate approved the minutes of the meeting.

2. REPORTS FROM COMMITTEES AND COUNCILS
Executive Committee. Senate received the report for information.

Graduate & Research Council. Senate received the report for information.

Undergraduate Council
Academic Regulations Related to Assignments, Tests, and Final Exams - Accommodations. Senate approved revisions to the section of the undergraduate calendar titled “Academic Regulations Related to Assignments, Tests, and Final Exams – Accommodations,” effective as of 1 September 2018.
Class Attendance. Senate approved revisions to the section of the undergraduate calendar titled “General Information – Class Attendance,” effective as of 1 September 2018.

Student Responsibility – Degree Requirements. Senate approved: (a) the removal of Faculty-specific text on student responsibility for meeting degree requirements from the sections of the undergraduate calendar outlined in the report; and (b) the addition of new text to the section of the undergraduate calendar titled “General Information,” effective as of 1 September 2018.

Student Responsibility – Full Course Load and Non-Academic Activities. Senate approved: (a) the removal of Faculty-specific text on student responsibility related to maintaining a full course load and engaging in non-academic activities form the sections of undergraduate calendar outlined in the report; and (b) the addition of new text to the section of the undergraduate calendar titled “General Information,” effective as of 1 September 2018.

Awards and Financial Aid. Senate approved: (a) the removal of the individual award descriptions currently found in the “Awards and Financial Aid” section of the undergraduate calendar; and (b) revisions to the remaining introductory pages as outlined in the report, effective 1 September 2018.

Residency Rules. Senate approved: (a) the removal or revision of Faculty-specific text on residency rules, as noted in the report; and (b) the addition of the new, institution-wide policy to the undergraduate calendar, effective as of 1 September 2018.

Senate received the remainder of the report for information.

3. REPORT OF THE PRESIDENT
   Recognition and Commendation. Senate received the report for information.

4. REPORTS FROM THE FACULTIES
   Senate received the reports for information.

5. COMMITTEE APPOINTMENTS
   Senate approved the following appointments:
   • Amit and Meena Chakma Awards for Exceptional Teaching by a Student Committee: appointment of Brianna Bennett, Anastasiya Mihaylova, Maya Venters, Cathy Wang, and Laura Williams as student representatives, terms to 31 December 2018.
   • Distinguished Teacher Awards Committee: appointment of Brianna Bennett, Anastasiya Mihaylova, Maya Venters, and Laura Williams as student representatives, terms to 31 December 2018.

   Senator Freeman asked that item #5 in the Senate Undergraduate Council report re: Grading System, and Senator Dea asked that attachment #1 re: the Final Assessment Report for combinatorics and optimization be moved to the regular agenda.

   The question was called, and, subject to the two items moved to the regular agenda as described above, the motion carried unanimously.

Regular Agenda

6. BUSINESS ARISING FROM THE MINUTES
   Co-op Employer Retention Rates. Jarvie provided information regarding a request made at the October Senate meeting to share co-op employer retention rate data. Jarvie advised that: the number of active employers with repeat hiring over two years has increased 13.6% since 2013/14 to more
than 6,900 (due to a change in definition from employers who posted to employers who hired); the number of jobs posted has increased 39.8% to 21,800 over the same time period; there were more than 1,700 interviews on a single day, surpassing last year’s high by about 300; employer retention can vary with market among other things (for example, in software engineering, computer science, and electrical and computer engineering, more jobs are being posted than there are students scheduled out on work terms). Jarvie stated her belief that the trends are positive and advised that her department keeps a close eye on this activity.

7. TEACHING PRESENTATION – KELLY GRINDROD, SCHOOL OF PHARMACY
Professor Grindrod was introduced by Coniglio. Grindrod’s presentation, “Pharmacy 5in5,” introduced Senators to the rapidly changing practice in her field, issues pharmacists face today, teaching concepts, adaptations and decision making, and methods of sharing key information in the field.

In discussion: conversation re: national standards and provincial regulations, and the value of interdisciplinary activities with other faculties like engineering and arts.

8. REPORTS FROM COMMITTEES AND COUNCILS

Executive Committee
Senate received proposed changes to Bylaws 1, 2, 3, and 4 for first reading. The proposed changes will be brought to Senate for approval by second reading at the 15 January 2018 meeting.

Members heard: the position of “Associate Provost, Resources” is being eliminated, and with the establishment of the position of “Deputy Provost, Integrated Planning and Budgeting”, it is proposed that Senate Bylaw 4; the proposed change does not change the constituency ratios and so there are no other changes necessary to Senate representation; there are a number of other small housekeeping items as a result of this change, and to other titles in all of Senate’s bylaws.

In response to a question, the president advised that the deputy provost position is meant to liberate some of the provost’s time on budgetary issues, but has no role in academic matters. Members received the proposed changes and understood they will return to the 15 January 2018 meeting for approval.

Graduate & Research Council
Senator Dea spoke to the Final Assessment Report for combinatorics and optimization which was moved from the consent agenda. She expressed concern regarding the commentary in the report about the underrepresentation of women and asked for clarity on actions taken to address the concerns. A Senator from that department spoke to the department’s efforts, and Casello advised that he will follow up on this question at the next meeting of Senate.

Faculty of Environment. Senate heard a motion to approve a new PhD program in Sustainability Management, effective 1 September 2018, as presented the attachment.

Casello and Dea. Carried unanimously.

Undergraduate Council
Senator Freeman spoke to the Grading System motion which was moved from the consent agenda. He advised that it remains unclear what he is allowed to do as an instructor if he wishes to deviate from the prescribed grading system, the process is not clear, and it seems unusual for assignments to be identified as required. In response, Coniglio advised that tweaks may be necessary, but the intention as understood by the Undergraduate Operations Committee and Undergraduate Council has been to develop a common understanding across the Faculties; both bodies provided unanimous
consent after much consultation and consideration. He invited Freeman to attend the Undergraduate Operations Committee to explore his concerns.

Senate heard a motion to approve revisions to the Faculty-specific sections of the undergraduate calendar re: the grading system, as well as the “General Information – Grading System” section of the undergraduate calendar, as proposed, and effective 1 September 2018.

Coniglio and Casello. Carried. Senate understood that any changes as a result of further consideration by Undergraduate Council will be brought forward in the new year.

Senate heard motions to the following effects:

**Faculty of Engineering, Architectural Engineering.** That Senate approve the proposed new plan in architectural engineering as described in attachment 1, effective 1 September 2018.

Coniglio and Douglas.

In response to a question, Scott Walbridge, associate professor in the Department of Civil and Environmental Engineering advised that work is being done to ensure capital improvements at the School of Architecture will be completed by the time these students attend there. Douglas advised that consideration of the number of credits needed is being looked at by the Faculty as it reviews all its programs’ accreditation standards.

The question was called and the motion carried unanimously.

**Faculty of Engineering, Artificial Intelligence.** That Senate approve the creation of a new option plan in artificial intelligence as described in attachment 2, effective 1 September 2018.

Coniglio and Douglas.

In discussion: regarding the number of students anticipated, there is some concern there will be too many applicants, the university is looking at resources needed, and advice that discussion of the number of students allowed to take the option resides at the Faculty level; discussions are underway by engineering (and mathematics) with the Faculty of Arts about links and opportunities for collaboration.

The question was called and the motion carried.

**Faculty of Engineering, Biomedical Engineering.** That Senate approve the formalization of two specialization plans in sports engineering and neural engineering as described in attachment 3, effective 1 September 2018.

Coniglio and Douglas.

In response to a question, Rush confirmed that conversations have occurred with the Faculty of Applied Health Sciences.

The question was called and the motion carried unanimously.

**Faculty of Environment, Southeast University 2+2 Program.** That Senate approve the 2+2 arrangement with Southeast University (SEU) of China as documented in the agreement set forth in attachment 4, effective 1 September 2018.
Coniglio and Seasons. Carried unanimously.

**Faculty of Environment, Knowledge Integration.** That Senate approved the creation of a science, technology & society (STS) specialization plan as described in attachment 5, effective 1 September 2018.

Coniglio and Seasons. Carried unanimously.

**Faculty of Mathematics, David R. Cheriton School of Computer Science.** That Senate approve the creation of a new option plan in artificial intelligence as described in attachment 6, effective 1 September 2018.

Coniglio and Poulin.

In response to a question, Poulin advised that the Faculty intended on limiting enrollment in CS 490.

The question was called and the motion carried.

**Faculty of Mathematics, Statistics & Actuarial Sciences.** That Senate approve the following changes for the statistics for health honours plan: (a) name change from “Statistics for Health” to “Biostatistics;” and (b) changes to required courses as set forth in attachment 7, effective 1 September 2018.

Coniglio and Poulin. Carried unanimously.

**Faculty of Environment, International Development.** That Senate approve the inactivation of the option plan in international development, effective 1 September 2018.

Coniglio and Seasons. Carried unanimously.

**Faculty of Mathematics, Statistics/Computer Science.** That Senate approve the inactivation of the joint statistics/computer science plan, effective 1 September 2017.

Coniglio and Poulin. Carried unanimously.

**University Committee on Student Appeals**

Congilio briefly reviewed the report and in response to questions advised: work is being done to make reporting more consistent; some reclassifications have occurred which may affect results; recently approved (by Senate) plagiarism guidelines have been helpful in informing students about this subject; orientation activities relating to academic integrity do occur.

Senate heard about various activities on this front in the graduate sphere, and in science from a Senator from that Faculty, following which Senate received the report for information.

9. **REPORT OF THE PRESIDENT**

Hamdullahpur reported on a number of items, including: last week’s town hall; recent meetings with government; research activities and advice that the work of the Nominating Committee for the Vice-President, Academic & Provost continues apace.

10. **Q&A PERIOD WITH THE PRESIDENT**

There were no questions.
11. REPORT OF THE VICE-PRESIDENT, ACADEMIC & PROVOST
   The vice-president briefly reported on a recent announcement by the provincial government
   regarding a desire to increase STEM graduates in the province in the next few years.

12. REPORT OF THE VICE-PRESIDENT, UNIVERSITY RESEARCH
   Bruce Muirhead, attending on behalf of Vice-President Dean, provided members with brief remarks
   on activities outlined in the vice-president’s written report.

13. OTHER BUSINESS
   At the chair’s invitation, Clubine suggested Senators review the report of the Council of Ontario
   Universities and, amongst others, the Ontario Undergraduate Student Alliance called: “In It
   Together: Taking Action on Student Mental Health”.

Senate convened in confidential session.

4 December 2017
Karen Jack
University Secretary
Secretary to Senate
CONFIDENTIAL SESSION

Confidential minutes have been removed.
Senate Graduate & Research Council met on 13 November 2017 as well as 11 December 2017 and agreed to forward the following items to Senate for information as part of the consent agenda.

Further details are available at: https://uwaterloo.ca/secretariat/committees-and-councils/senate-graduate-research-council

FOR INFORMATION

CURRICULAR SUBMISSIONS
On behalf of Senate, new courses, course revisions, course inactivations, and minor program revisions were approved for the Faculties of Applied Health Sciences (kinesiology, recreation and leisure studies, school of public health and health systems), Engineering (school of architecture and departments of chemical, civil and environmental, mechanical and mechatronics, and systems design engineering), Environment (department of geography and environmental management), Math (computer science, statistics and actuarial science), as well as Renison University College (English for multilingual speakers).

GRADUATE AWARDS
On behalf of Senate, council approved the UW Tri-Agency Degree Completion Award (operating), GradTalks Research Dissemination Award (operating), Toyota Canada Automotive Safety Graduate Scholarship (trust) and the Walrus Award in Political Science (endowment).

ACADEMIC PROGRAM REVIEW REPORTS
a. Final Assessment Report – Pure Math [Attachment #1]

TEXT MATCHING SOFTWARE
On behalf of Senate, council reviewed recommendations from the Office of Academic Integrity and Centre for Teaching and Learning and approved Turnitin to be activated but not enabled by default in LEARN. Recommendations included: (1) draft text for insertion within the undergraduate calendar; (2) modified course outline boilerplate, Turnitin may be used, remove reference to Patriot Act; and (3) the drop box to be checked by faculty in LEARN when enabling Turnitin. [Attachment #2]. Senate Undergraduate Council reported approval of Turnitin to Senate on 20 November 2017.

//kw  Jeff Casello                    Charmaine Dean
     Associate Vice-President, Graduate Studies and Postdoctoral Affairs  Vice President, University Research
Summary of the Program Review:
In accordance with the University Institutional Quality Assurance Process (IQAP), this final assessment report provides a synthesis of the external evaluation and the internal response and assessments of the programs (BA, MMath PhD) delivered by the Department of Mathematics. A self-study (Volume I) was submitted to the Associate Provost, Graduate Studies1 on June 12, 2015. The self-study presented the program descriptions and learning outcomes, an analytical assessment of this program, and program data including the data collected from a student survey along with the standard data package prepared by the Office of Institutional Analysis & Planning (IAP). Appended were the course outlines for all courses in the program and the CVs (Volume II) for each full-time faculty member in the Department.

Two arm’s-length external reviewers (Volume III), (Dr. Karl Dilcher, Professor of Mathematics, Dalhousie University and Dr. James Mingo, Professor of Mathematics, Queen’s University, were ranked and selected by the Associate Provost, Graduate Studies, in addition one internal reviewer (Dr. Larry Swatuk, Associate Professor of Environment).

They reviewed the self-study documentation and then conducted a site visit to the University on March 28-29, 2016. The visit included interviews with the Vice-President, Academic & Provost; Associate Provost, Graduate Studies; Dean of the Faculty; Faculty Associate Dean of Graduate Studies; Chair of the Department Faculty members; staff and meetings with a group of current graduate students.

This final assessment report is based on information extracted, in many cases verbatim, from the self-study, the external reviewers’ report and the program response.

Program characteristics:
The Department of Pure Mathematics (Pure Math) began in 1967 as one of the five departments in the newly created Faculty of Mathematics. The objective of the MMath in Pure Mathematics program is to develop and enhance students’ mathematical knowledge and independent learning skills. This is done by deepening and broadening their mathematical understanding, and by

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1 The Associate Provost, Graduate Studies title changed to Associate Vice-President, Graduate Studies and Postdoctoral Affairs as of June 2017.
guiding them through the process of independently exploring a specialized mathematical topic at a deep level and communicating their findings to others.

The objective of the PhD program is to develop independent research mathematicians who are prepared for a career in academia at an institution for higher learning. Students are required to attain substantial breadth and depth of knowledge and understanding of mathematics, as well advancing the state of knowledge by carrying out original, independent, publishable research.

Summary of strengths, challenges and opportunities based on self-study:

Strengths

- The program has internationally renowned researchers who have strong mentorships with students
- The program features outstanding research groups with a focus on algebra/logic and geometry/topology as well as exceptional strength in functional analysis and number theory
- Pure MMath graduates have a high level of employability and many go on to pursue a PhD
- PhD graduates are also very successful in obtaining good postdoctoral positions
- The program is recognized within the Faculty of Math to have outstanding and dedicated teachers and supervisors
- The Pure Math Department is known to have a very collegial, collaborative atmosphere
- Graduate students in Pure Math have been very successful in winning NSERC awards in addition to prestigious Trillium awards
- The level of program funding is competitive making it attractive for Canadian and Permanent Residents
Challenges

- Due to small size of the Pure Math Department it is unable to offer a large number and variety of courses as compared with larger departments

- The Department’s NSERC Discovery Grants are used to capacity and cannot accommodate further growth (e.g., provide more postdoctoral positions)

- Pure Math would like to improve funding for international students to make it comparable to students who are Canadian or Permanent Residents

- The program finds the current NSERC scholarship model frustrating as it seems to put emphasis on publications rather than depth of training

Opportunities

- The program has the workload capacity to supervise more postdoctoral fellows, but not the funds to support more positions

- Pure Math would like to provide better teacher-training opportunities for students. A mentoring system is in place for those teaching their own courses; however, the Department would like to provide this opportunity for senior students wanting an academic career

- The Waterloo ‘brand’ in mathematics is very strong at the undergraduate level. This could be used to build the strongest PhD program in Canada and one that would rival the top programs in the United States

Summary of key findings from the external reviewers:

The Department of Pure Mathematics offers high-quality graduate programs at the Master’s and PhD levels. These programs are well administered and have been well received by students and alumni, with very good measurable outcomes.

The quality of graduate supervision is very high, and supervisors are approachable and available. In interviews, faculty expressed the importance of good supervision, while students showed a great degree of satisfaction with the level of supervision.
In summary, the reviewers had no doubt that the current quality of the graduate programs can and will be maintained in the future. In fact, they see the potential of these program rising to the very top among comparable programs, thus matching the reputation and quality of the undergraduate mathematics program.

Program response to external reviewer recommendations:

Recommendations

1. “We recommend that the Department not offer a direct entry to the PhD program without a MMath (or equivalent) degree.”

Response
This is the current practice of the Department. As recommended by the Reviewers, the Department will continue to follow this practice while also continuing to make good use of the ‘fast track’ admission option whereby highly qualified applicants are guaranteed admission to the PhD program, following the completion of their Masters’ degree, provided they achieve specific markers of excellence in their first term of the MMath program.

2. “We recommend that the Department work with the Office of Graduate Studies and Postdoctoral Affairs (GSPA), to try to resolve this issue [the issue being the restricted opportunities to take 600 level courses and hence combined undergraduate and graduate course offerings]. On the part of the Department this may involve making the different expectations (including expected extra work) between the two groups of students [the groups being undergraduate and graduate students] clearer and more explicit in all course descriptions.”

Response
The Department will be very pleased to work on this in consultation with the Associate Vice President GSPA as it acknowledges the benefit of providing their students with the opportunity to take more of the ‘held-with’ 600 level courses. The Department thanks the Reviewers for acknowledging the high quality of the undergraduate students taking these classes alongside graduate students. There are different expectations for the two groups of students in these courses and the Department is committed to ensuring that this is clearly specified. The Department intends to implement this recommendation quickly.
3. “We recommend that the Department review the comprehensive exam procedures.”

Response
The Reviewers specifically mentioned concerns about the variability of the difficulty of the written exams and the timing of the oral exam. The Graduate Committee takes seriously their responsibility for ensuring consistency of the written exams. This is a topic of on-going discussion in the Graduate Committee. The Graduate Officer will monitor student progress and will advise supervisors when it is time to complete the oral exam.

4. “We recommend that the Department provide some flexibility in the MMath program.”

Response
The Reviewers were specifically addressing the length of the program. Partially in response to a recommendation at the time of the last external review, the Department changed their MMath program from a two-year to a one-year program. As the current Reviewers noted, most faculty members and students are happy with this change. However, there is a diversity of opinion in the Department and the Graduate Committee will discuss this further. Currently students are allowed the flexibility of an additional term when this is felt to be academically appropriate and the Department will continue to consider time extension requests on a case-by-case basis.

5. “The Department should write a 5 year proposal to present to the Dean and the Provost outlining a plan that would achieve this goal [to build the strongest PhD program in Canada] by making appointments above the assistant professor level.”

Response
Over the summer, the Department will develop a long range hiring plan, in consultation with the Dean, as part of the Math Faculty strategic planning process. As the Reviewers remarked, it is only through hiring high quality people that we will be able to substantially improve the quality of our graduate programs. We note that at this time there are no regular faculty members who have indicated firm plans to retire in the next 3-5 years, so hiring would likely require additional resources.
Implementation Plan:

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Proposed Actions</th>
<th>Responsibility for Leading and Resourcing (if applicable) the Actions</th>
<th>Timeline for addressing Recommendations</th>
</tr>
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<tbody>
<tr>
<td>1. We recommend that the Department not offer a direct entry to the PhD program without a MMath (or equivalent) degree</td>
<td>This is the current practice and the Department will continue to follow this practice.</td>
<td>Chair</td>
<td>On-going</td>
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<tr>
<td>2. We recommend that the Department work with the Office of the Associate Provost, Graduate Studies* [now GSPA], to try to resolve this issue [the issue being the restricted opportunities to take 600 level courses]. On the part of the Department this may involve making the different expectations (including expected extra work) between the two groups of students [the groups being undergraduate and graduate students] clearer and more explicit in all course descriptions.”</td>
<td>The Department will work on this in consultation with the Associate Provost as it acknowledges the benefit of providing their students with the opportunity to take more of the ‘held-with’ 600 level courses</td>
<td>Chair</td>
<td>2017-2018</td>
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<td>3. We recommend that the Department review the comprehensive exam procedures</td>
<td>Ensuring consistency of the written exams is a topic of on-going discussion in the Graduate Committee. The Graduate Officer will monitor student progress and</td>
<td>Graduate Committee and the Graduate Officer</td>
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<td>4.</td>
<td>We recommend that the Department provide some flexibility in the MMath program.</td>
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<td>Chair</td>
<td>2018</td>
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The Department Chair/Director, in consultation with the Dean of the Faculty shall be responsible for monitoring the Implementation Plan.
Date of next program review: 2022

Date

Signatures of Approval:

Chair/Director

Date

AFIW Administrative Dean/Head (For AFIW programs only)

Date

Faculty Dean

Date

Associate Vice-President, Academic
(For undergraduate and augmented programs)

Date

Associate Vice-President, Graduate Studies and Postdoctoral Affairs
(Formerly known as the Associate Provost, Graduate Studies)
(For graduate and augmented programs)

Date
MEMO

To: Alice Raynard & Kathy Winter, Secretariat
From: Amanda McKenzie, Office of Academic Integrity & Mary Power, Centre for Teaching & Learning
Date: October 19, 2017 Updated Nov 14, 2017

Please accept the following information for consideration at the next Senate Graduate and Research Council meeting. This documentation was approved at UOPS as well as SUC on October 17, 2017. Hence, we are submitting it to SGRC for approval as it applies to all courses available in LEARN.

We propose 3 specific steps be taken in order to allow Turnitin to be activated but not enabled by default in LEARN:

1) A statement that text-matching software, in the form of Turnitin, is used at the University of Waterloo be added to the UG Calendar under the section on Academic Integrity http://ugradcalendar.uwaterloo.ca/page/uWaterloo-Academic-Integrity. It is suggested that this statement include that it is the instructor’s responsibility to ensure that the students are notified if Turnitin is to be used and to assign an opt-out option. It should also state that it is the student’s responsibility to let the instructor know immediately that they intend to opt-out. The boilerplate text or link to it could also be included in this section.

2) The course outline boilerplate text be modified to state that Turnitin MAY be used. This statement should be then included in the required statements.

Current wording:

Turnitin.com: Text matching software (Turnitin®) will be used to screen assignments in this course. This is being done to verify that use of all materials and sources in assignments is documented. Students will be given an option if they do not want to have their assignment screened by Turnitin®. In the first week of the term, details will be provided about arrangements and alternatives for the use of Turnitin® in this course.

Note: students must be given a reasonable option if they do not want to have their assignment screened by Turnitin. See: https://uwaterloo.ca/academic-integrity/guidelines-instructors for more information.
Suggested wording:

**Turnitin.com:** Text matching software (Turnitin®) may be used to screen assignments in this course. Turnitin® is used to verify that all materials and sources in assignments are documented. Students’ submissions are stored on a U.S. server; therefore students must be given an alternative (e.g., scaffolded assignment or annotated bibliography) if they are concerned about their privacy and/or security. Students will be given an option if they do not want to have their assignment screened by Turnitin®. Due notice, in the first week of the term and/or at the time assignment details are provided, about arrangements and alternatives for the use of Turnitin® in this course.

**Note:** students must be given a reasonable option if they do not want to have their assignment screened by Turnitin. See [https://uwaterloo.ca/academic-integrity/guidelines-instructors](https://uwaterloo.ca/academic-integrity/guidelines-instructors) for more information.

3) The text within the LEARN dropbox where faculty must check to enable Turnitin be modified in the form of a disclaimer.

Suggested wording:

“By checking this box, I will ensure that the appropriate statement is included in my course outline, that students are provided ample notice to opt out of this software, and that I will provide a fair and reasonable alternative evaluation method”.

![Turnitin Integration](image)
Senate Undergraduate Council met on 19 December 2017 and agreed to forward the following items to Senate for approval and for information. Council recommends that these items be included in the consent agenda.

Further details are available at: uwaterloo.ca/secretariat/committees-and-councils/senate-undergraduate-council

FOR INFORMATION

CURRICULAR MODIFICATIONS
Minor plan changes, regulation changes, course submissions and revisions to effective dates were received for information or approved, as applicable, for the Faculty of Arts (medieval studies, residency requirements, transfer credits); Faculty of Environment (certificate with Niagara College); Faculty of Mathematics (honours computational math, honours computational math minor, math studies/business specialization); Faculty of Science (minor in biology, minor in physics, honours science and business programs, honours co-operative science and business (physics specialization), honours co-operative geochemistry).

CO-OPERATIVE EDUCATION
In April 2017, Senate approved changes to the Co-operative Education and Career Action section of the 2018/19 Undergraduate Calendar, including the creation of (1) Co-op Certificates, starting with the Co-op Research Certificate; and (2) two types of work experiences eligible for Co-op credit. Before and after approval by Senate, Co-op has been asked whether it can make these opportunities available to all students, including those who have completed the requirements before Fall 2018 or are following calendars earlier than Fall 2018. As part of the implementation planning process, Co-op has determined that this is feasible. Both the Co-operative Education Council and Senate Undergraduate Council have endorsed this proposal.

ACADEMIC PROGRAM REVIEW REPORTS
Council approved the attached Final Assessment Report for Management Studies (Minor) (Attachment #1) on behalf of Senate.

NEW UNDERGRADUATE AWARDS
Attachment #2 to this report contains a list of newly-approved undergraduate scholarships, awards and bursaries.

Mario Coniglio
Associate Vice-President, Academic

/rmw
Final Assessment Report
Management Studies (Minor)¹
February 2017

Summary of the Program Review:
In accordance with the University Institutional Quality Assurance Process (IQAP), this final assessment report provides a synthesis of the arm’s-length internal evaluation and the internal response and assessments of the Management Studies (MS) Minor delivered by the Department of Economics. The Self-Study Volume I was submitted to the Associate Vice-President, Academic in November 2015. This volume presented a program description, learning outcomes, and an analytical assessment of the program, as well as student and alumni survey responses and the standard data package prepared by the Office of Institutional Analysis & Planning (IAP). The Self-Study Volume II contained the CV for Geoffrey Malleck, the Director of Management Studies.

Two arm’s-length internal reviewers were selected by the Associate Vice-President, Academic: Professor Scott Taylor (Chemistry), and Professor Manoj Sachdev (Electrical and Computer Engineering). Taylor and Sachdev reviewed the Self-Study documentation and conducted a site visit on February 5, 2016. The visit included interviews with the Associate Vice-President (Academic), Dean of Arts, Associate Dean of Arts (Undergraduate), the Chair and the Undergraduate Associate Chair in the Department of Economics, the Director of MS, administrative support staff and students currently enrolled in the minor.

This final assessment report is based on information extracted, in many cases verbatim, from the self-study, the reviewers’ report and the program response.

Program characteristics:
The Management Studies Minor is designed to provide the theoretical background relevant (1) to current management practice useful in many entry-level management positions and (2) as a basis for further education in management. The Management Studies Minor provides a unique opportunity for students in non-business programs to complement their primary area of study with a practical knowledge of business management.

The program targets students studying for an honours degree and general degree students whose career goals are connected to management.

¹ An MS option was offered up until August 2012, at which time all options were removed from the Faculty of Arts. In addition, as of September 2015, Management Studies was offered as a minor, hence a diploma in this program is no longer available.
Summary of strengths, challenges and weaknesses based on self-study:

Strengths

- Director teaches several courses to students enrolled in the Management Studies Minor including ECON 344/ARBUS 302 and ARBUS 400 and is able to garner feedback for program improvement on a continuous basis.
- Given the program director’s strong community ties in the business community, professionals in business are able to advise on desired outcomes from the program. In the past, this has been done by consulting an informal group of individuals from the private sector who were willing to offer perspective on the design of ARBUS 200, 300, and 400.
- 85% of current students feel the courses offered in the minor are of value to career aspirations.
- Project management modules offered in the Management Studies Minor allow students to qualify to write the Certified Associate in Project Management (CAPM).
- While a majority of students enrolled in the minor reside in the faculty of Arts, an increased interest and participation in the program from students from other faculties has been noted. This has been realized without any promotion. More deliberate promotion in other Faculties will likely attract additional students.

Challenges & Weaknesses

- While Management Studies does not offer specific courses, there has been an effort to collaborate with other programs in the Faculty of Arts, specifically the Arts and Business program.
- Increased number of students enrolled in the minor has created some enrollment challenges. From less than 50, five years ago, the program has grown to over 300. Reserve spaces in classes for students in the minor have increased demand for the courses.
- The potential overlap with other programs (e.g., Entrepreneurship Minor) may confuse students as to which program is the best match for their goals.
- Students are sometimes unable to complete the program requirements due to lack of space in the required classes. This is not under the control of the program itself.
- The ability to earn a minor in Management Studies has been largely ignored as a means to attract students to the University of Waterloo. Marketing and Undergraduate
Recruitment could leverage the popularity of the minor to attract students who wish to pursue a liberal arts degree while gaining limited exposure to important management practices.

**Summary of key findings from the external reviewers:**

Overall, alumni and current students provided mainly positive feedback about all of the required courses, the quality of teaching and the minor in general. All four of the students interviewed thought that the number of required courses (8) was appropriate. As of 2012, the MS students are required to take ARBUS 200 and ARBUS 400. The inclusion of ARBUS 400, a capstone course where students are placed in a dynamic simulation, is seen as being particularly constructive as judged by the very positive feedback received from students who are currently taking this course as well as alumni who took the course. This simulation allows students to assume the role of a business owner making decisions about launching and promoting a product in the market place. The simulation uses commercially available software. The project management modules offered in the MS Minor allow students to qualify to write the Certified Associate in Project Management (CAPM) exam. CAPM certification was looked upon as being important to the four students that were interviewed. Several alumni wished to see courses that are less technical but more practical – it is possible that these alumni did not have the opportunity to take ARBUS 400. Several current students expressed a desire for a public speaking course and a leadership development course in the minor (as options).

**Program response to external reviewer recommendations:**

**Recommendations**

1. The enrolment in the MS Minor has increased significantly in recent years. Should enrolment continue to significantly increase then we recommend that the minimum average for enrolment be increased back to 70 % or even higher.\(^2\) This would give the MS Minor some degree of exclusivity and help to ensure that the MS Minor will be conferred upon highly-qualified students. We would expect that such students would be highly sought after by potential employers. The Minor should also be publicized within the university, and outside to further improve the quality of incoming students.

**Response:** Almost all minors in the Faculty of Arts have a minimum special average (computed across all courses that may be used towards the minor) of 65%. The reviewers suggest an increase in this average requirement in order to control increasing enrollments

\(^2\) The minimum average was previously 70% before being reduced to 65%

February 2017
(and thus course demands) and to make the minor more highly valued/exclusive. The Curriculum Committee will consider whether a higher minimum average is warranted for the MS minor.

2. Allow MS Minor students to take ARBUS 300 and ARBUS 400 in the same term (ARBUS 300 is currently a prerequisite for ARBUS 400). This would help alleviate scheduling issues that some of the students have encountered and it appears that the two courses can be taken independently of one another.

Response: This recommendation will be reviewed by the newly established Curriculum Committee.

3. Eight is an appropriate number of required courses for the Minor and should not be increased or decreased.

Response: No response needed.

4. A set of optional courses should be developed to further enrich the Minor. For example, a public speaking course and a leadership development course should be considered. Resources should be provided for the development and mounting of these new courses.

Response: The Department of Economics is undergoing a full review of the minor to determine opportunities to build a better minor. A curriculum committee has been struck with the goal of determining the best courses (existing or new) to deliver within the minor. Factored into the dialogue is the potential to introduce Management Studies courses. This is being driven by several factors including a requirement to move away from ARBUS 200, 300 and 400 as required courses for the MS minor, at the request of the Associate Dean, Co-op, Administration and Planning.

5. Involve entrepreneurs and other local business persons in the program either as guest lecturers or as informal advisors/mentors for students.

Response: The director has made it a regular practice to survey local employers, community leaders for input on any potential change. Students are also given an opportunity to share their perspective on existing and proposed changes. Recruiting local leaders as guest lecturers and mentors would be highly valuable to the students, and is already done to some degree in the ARBUS program. The Curriculum Committee will consider the possibilities for involving local employers and community leaders in the revised curriculum.
6. Establish a curriculum committee. This committee would meet periodically (perhaps 2-3 times a year for the next 2-3 years and then annually). Its function would be to recommend changes in the curriculum that may be required as the minor evolves. This committee should include faculty from not only Economics (e.g., Geoff Malleck, Lutz-Alexander Busch) but also other departments from which students taking the MS Minor are enrolled (e.g., political science, etc.).

Response: This has been implemented. A committee consisting of four individuals has been struck. The members are Geoffrey Malleck, Olivia Mesta, Joel Blit and the committee is chaired by Lutz-Alexander Busch (Associate Chair, Undergrad). An initial meeting (August 11, 2016) reviewed the objectives and desired outcomes of the minor, determined group objectives and listed viable subjects that should be considered. We have not included other departments on the curriculum committee since the program is entirely housed in Economics. However, the committee will consult with other departments where there is significant involvement of their students.

7. As pointed out in the MS Nov. 2015 self-study report and the previous assessment of the MS Minor in 2009, “the heavy reliance on existing courses is not optimal for promoting the professional identity and community-membership goals of the program.” This minor should have its own MS designed course, whether it be a more general second year course or a very specialized fourth year course. This course would focus on the specific goals of the MS Minor (perhaps a more practical and less technical course as suggested by some alumni). It could take the place of one of the currently 8 required courses. Such a course was proposed in a previous assessment (in 2009) and strategic plan of the MS Minor but it does not appear to have been implemented.

Response: Consistent with point 6 above, the Committee agreed that consideration of a course or suite of courses would serve a number of advantages including:

- Better alignment to the MS Minor objectives and outcomes;
- A revenue generating opportunity to offer the new courses to other programs;
- An opportunity to change the identity of courses that are offered as ECON xxx courses but are somewhat outside true economic theory (example- ECON 344-Marketing) to MGMT xxx designations. This can be done within the Economics Department.

8. On-line delivery of some courses should be considered (if possible). This could alleviate the scheduling issues that have been encountered.
Response: This will be considered when designing the updated course requirements for the minor. Some courses that are adopted into the minor may already offer the on-line version. It will also be factored into the creation of any new courses.

9. The University/Economics Department should consider promoting a double minor as an option to the ARBUS program i.e. MS minor + minor in accounting or linguistics etc. However, number of courses required for a double minor could be far fewer than sixteen.

Response: In the past the Minor was explicitly prohibited for any students in X & Business programs. It has been designed as an alternative to ARBUS. This suggestion would require a completely different minor that builds on ARBUS instead. It is a valuable suggestion more towards improving the ARBUS offering in Arts and should be considered in that context, but misses the current purpose of the Minor as a quite focused alternative to ARBUS.

10. There should be a small budget associated with the MS Minor.

Response: The task force assigned to the Minor will consider whether a budget may be needed for communication, outreach and promotional activities, as well as for specific events such as guest speakers. At the moment there are no plans to request a budget.

11. A MS web page should be established and located within the Department of Economics. This web page would enable students to easily find the necessary information about the minor and it could also act as a tool for recruiting students to UW (and from within UW) who are interested in earning a minor in MS.

Response: This will be done as part of initiatives that follow any changes to the minor.

12. The number of students taking this minor is now 334 (an increase of 100 from the previous year). It is very possible that enrolment will continue to increase especially if the minor is properly advertised (mainly via a MS web site). The University/Economics Department should anticipate allocating additional resources (such as additional administrative assistance, additional personnel to help with teaching, more sections for required courses etc.) in future years.

Response: The department has been historically understaffed. An effort to offset this has been in place but will be further influenced by the need to support this minor. This recommendation will be a component of a business plan to rebuild the MGMT minor.
13. An associate director for the minor should be appointed. This person will provide additional teaching and administrative resource to the director and could direct the program if the director was away. This individual should be a faculty member from a department that have significant interest in the minor.

**Response**: The Associate Chair-Undergraduate in the department has already invested in the program. A staff member has also assumed some of the responsibilities; primarily in admissions. We do not think that an Associate Director is needed.

14. Establishment of the curriculum committee is vital to further improve the quality, breadth, and offerings of courses. There should be a student representative on the committee.

**Response**: Accomplished as noted above.

15. The minor should be better integrated into the Economics Department (the largest group of students enrolled in the MS Minor are Economics Majors). Currently, the program appears to be run almost entirely through the director. Other personnel in the department, such as the chair, associate chair and the Economics Department as a whole, should become more involved.

**Response**: This has been accomplished with the department of Economics assuming responsibility as of the Fall Semester 2015.

16. Written rules and guidelines for admitting students to the program and classes are needed. Also, guidelines need to be established about who is looking after what – chair of department, director of MS, undergraduate officer, administrative advisor, etc.

**Response**: Several members of the department of Economics have addressed the need to craft and implement policy to better manage the minor. This will be fully addressed between September 2016 and April 2017.

17. Have all those who work on the minor use a similar advising tool (such as ASIS which is used by the Arts Undergraduate Office and Economics) to make advising notes on student files. This would eliminate some of the back and forth with students and “he said, she said” when it comes to working with students that have seen other advisors. Making notes in the system allows support staff to see any previous advice or permissions that students received.
Response: This recommendation will be factored into the management of the minor.

Additional responses to reviewer comments:

Excerpt from page 5: “Both reviewers found it challenging to find information about the MS Minor online. Some of the students we interviewed also mentioned this was a problem. As it currently stands, you can only find information regarding the minor in the Undergraduate Calendar and you have to be really looking for it to find the information.”

Response: We agree that information about the minor needs to be easier to find. The committee will work on this and develop a formal marketing plan after final decisions have been made regarding a possible amendment of the minor. Marketing and Undergraduate Recruitment would strongly support any effort to market this minor.

Excerpt from pages 5-6: “According to the MS Nov. 2015 self-study report (Section 8.1), the increased number of students enrolled in the minor has created enrollment challenges. Reserve spaces in classes for students in the minor have increased demand for the courses. This could become a major issue if the program continues to expand at the current rate.”

Response: Enrollment challenges are already an issue. This will change with the aforementioned amendments to the minor as the Arts and Business students will not share the majority of the courses. The committee will also factor this into discussions.

Excerpt from page 6: “Nevertheless, this teaching load appears to be excessive when taking into account Malleck’s additional administrative duties. This could become an issue if the program continues to expand at the current rate. In addition, in the long run, a single instructor teaching multiple course in a minor is detrimental to the overall quality of the minor.”

Response: Several responsibilities have already been adopted by Kayla McKinnon and Lutz Busch. The formation of the committee will also reduce the direct responsibility. It will be up to the department chair to determine any additional actions.

Excerpt from page 7: “As mentioned before, in the report UDLEs are reviewed at the degree level, and drawing strong conclusions on UDLEs for a minor is not appropriate.”

Response: We will refrain from referring to UDLES in future reviews. However there is value in referring to learning outcomes and attained competencies in the minor which support the attainment of UDLES.
Excerpt from page 7: “Most of the courses for the minor are taught by faculty members that are not associated with the minor, and courses are not solely delivered for the students enrolled in the minor. Therefore, it is difficult to assess the suitability and expertise of the faculty to teach courses for the minor. However, ARBUS program faculty has significant expertise in the broad area of the minor. “

Response: This will also be impacted by the addition of MGMT specific courses within the department of Economics. The staffing of any new courses remains the discretion of the department chair and is impacted by resource constraints. The suggestion is shared by the director and duly noted.

Excerpt from page 8: “The survey of MS alumni provided important feedback on the quality of the program. Generally, students were satisfied with the education they received in the minor, however, they would like to add more breadth in course selection, and in some cases more rigor in offered courses. For example, topics such as human resource management, accounting and finance, inter-personal communication, etc. Similarly, some students observed that there is too much focus on entrepreneurship in the minor.”

Response: This Curriculum Committee will address this comment and, in particular, the extent to which entrepreneurship should be a topic for the MS Minor.

Excerpt from page 8: “Now that MS is housed in the Economics Department, and more people are involved with the program, Mary Synnott and Kayla McKinnon expressed the need for written rules and guidelines for admitting students to the program and classes so there is a clear work-flow, and reduced subjectivity in the decision making.”

Response: Now that oversight has shifted to Economics it will be important to create a work-flow and decision making hierarchy which addresses a number of concerns including student enrolment, responsibilities, marketing, data accumulation and dissemination.
**Implementation Plan:**

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Proposed Actions</th>
<th>Responsibility for Leading and Resourcing (if applicable) the Actions</th>
<th>Timeline for addressing Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Establishing a curriculum committee <strong>Recommendations 6, 14</strong></td>
<td>This has been done.</td>
<td>Undergrad Associate Chair</td>
<td>NA</td>
</tr>
<tr>
<td>2. Recommendations regarding the MS Minor curriculum such as the replacement of ARBUS courses with MS specific courses, possible on-line course delivery, developing optional courses to further enrich the minor, overlap with entrepreneurship, and recruiting of local business leaders as mentors. <strong>Recommendations 2, 4, 5, 7, 8, 9,</strong></td>
<td>All of these will be addressed by the new Curriculum Committee</td>
<td>Undergrad Associate Chair</td>
<td>Begin immediately and address over 2016-2018</td>
</tr>
<tr>
<td>3. Raising the required average for the minor to 70%. <strong>Recommendation 1</strong></td>
<td>To be considered by the new Curriculum Committee in consultation with the Chair and Associate Dean, Undergrad.</td>
<td>Undergrad Associate Chair</td>
<td>Begin immediately and address over 2016-2018</td>
</tr>
<tr>
<td>4. Making information about the minor easier to find <strong>Recommendations 11, 12</strong></td>
<td>Improve information available on Arts and Economics web pages.</td>
<td>Department Chair</td>
<td>2018</td>
</tr>
<tr>
<td>5. Address enrollment challenges relating to MS students in Arts and Business Courses <strong>Recommendations 2, 4, 9</strong></td>
<td>To be addressed as part of reforms proposed by curriculum committee as noted in point 1 above.</td>
<td>Undergrad Associate Chair</td>
<td>2016-2018</td>
</tr>
</tbody>
</table>
6. **Address the seemingly excessive teaching load of Geoffrey Malleck**  
   **Recommendation 13**  
   Reduce administrative responsibilities of Geoffrey Malleck related to the minor with more assistance from staff, if possible.  
   Department Chair  
   2016 - 2017

7. **Obtain a small budget for the MS Minor**  
   **Recommendation 10**  
   This request will be made in the next budget year.  
   Department Chair  
   February 2018

8. **Address the staff needs of the minor**  
   **Recommendation 15**  
   The administrative work load associated with the minor will be monitored over the coming year. More staff resources will be requested if deemed necessary.  
   Department Chair  
   2016 - 2018

9. **Better integrate the administration of the program into the Economics Department administration.**  
   **Recommendations 15, 16**  
   The administrative procedures used in the Economics Department will now be adopted for the MS Minor.  
   Department Chair, Associate Chair, Undergrad, Program Director  
   2017 - 2018

10. **Establish written rules and guideline for the program.**  
    **Recommendation 16**  
    This will be worked on by the appropriate staff and faculty.  
    Associate Chair, Undergrad and Program Director.  
    2017 - 2018

11. **Use of ASIS for advising**  
    **Recommendation 17**  
    This will be considered in the next year.  
    Associate Chair, Undergrad and Program Director  
    2017

**Note:** Reviewer's Recommendation 3 requires no action and therefore is not in the implementation table above.

The Department Chair/Director, in consultation with the Dean of the Faculty shall be responsible for monitoring the Implementation Plan.
Date of next program review:  

<table>
<thead>
<tr>
<th>Date of next program review:</th>
<th>2022</th>
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<td>Date</td>
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Signatures of Approval:

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<tr>
<th>Chair/Director</th>
<th>Date</th>
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<tbody>
<tr>
<td>AFIW Administrative Dean/Head (For AFIW programs only)</td>
<td>Date</td>
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<tr>
<td>Faculty Dean</td>
<td>Date</td>
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<tr>
<td>Associate Vice-President, Academic</td>
<td>Date</td>
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<td>(For undergraduate and augmented programs)</td>
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<tr>
<td>Associate Provost, Graduate Studies</td>
<td>Date</td>
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<td>(For graduate and augmented programs)</td>
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NEW UNDERGRADUATE SCHOLARSHIPS, AWARDS, and BURSARIES
to be added to the UG Awards Database
- submitted for November 14, 2017 meeting of Senate UG Council -

ENTRANCE AWARDS

Class of 1985 Mechanical Engineering Entrance Bursary
One bursary, valued at $2,000, is awarded annually to a full-time undergraduate student entering Year One of the Mechanical Engineering program on the basis of financial need. To be considered, students must apply for the University of Waterloo Entrance Bursary program by April 15. This fund is made possible by a donation from alumni of the Mechanical Engineering class of 1985.

Method of Financing: annual donation (five-year pledge)

Ganesh Datt Perseverance Award
Two awards, valued at $1,500 each, will be provided annually to full-time undergraduate students enrolled in Year One of any program in the Faculties of Mathematics or Engineering on the basis of academic achievement and demonstrated financial need. Preference will be given to students from Westview Centennial Secondary School, C.W. Jefferys Collegiate Institute, and North Albion Collegiate Institute in Toronto. To be considered, students must apply for the University of Waterloo Entrance Bursary program by April 15. This fund is made possible by a donation from Ganesh Datt.

Method of Financing: annual donation (five-year pledge)

Traquair Family Scholarship
Two scholarships, valued at $25,000 each over eight academic terms, will be awarded annually to deserving undergraduate students enrolling in Year One of full-time degree studies: one to a student admitted to a program in the Faculty of Arts (excluding Accounting and Financial Management), and one to a student admitted to a program in the Faculty of Mathematics. Selection in the Faculty of Arts will be based on academic achievement. Selection in the Faculty of Mathematics will be based on a combination of academic achievement, Euclid Contest score, and Admission Information Form (AIF). Recipients will receive $5,000 in each of the 1A and 1B terms, and renewal payments of $2,500 per term for up to six terms beginning in 2A. Payments beyond Year One are dependent on the student maintaining an overall academic average of 80% or greater and full-time enrolment in an approved program. This fund is made possible by a donation from Brian (BMath ’79) and Janis Traquair (BA ’79).

Method of Financing: annual donation (four-year pledge)

UPPER-YEAR AWARDS

Janet Aizentros Engineering Scholarship
One scholarship, valued at $2,500, is awarded annually to a full-time undergraduate student enrolled in Year Two, Three, or Four in the Faculty of Engineering on the basis of academic achievement (minimum 80% cumulative average) and an essay describing the positive impact they have had to the African, Caribbean or Black Canadian communities through extracurricular or volunteer involvement. Preference will be given to female applicants. Interested students should submit an application by October 1. This fund is made possible by a donation from Janet Aizentros to encourage women to pursue careers in technology.

Method of Financing: annual donation (five-year pledge)
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Desjardins General Insurance Scholarship in Actuarial Science
One scholarship, valued at $2,500, will be awarded annually to a full-time undergraduate student enrolled in Year Three or Four of the Actuarial Science program in the Faculty of Mathematics. Selection will be made on the basis of academic achievement (minimum 80% cumulative average), community involvement, extracurricular activities, and interest in the area of property and casualty insurance. Interested students should submit an application by June 15. This fund is made possible by a donation from Desjardins General Insurance.

*Method of Financing: annual donation (four-year pledge)*

Rajendra and Shanta Dubey Women in STEM Scholarship
One scholarship, valued at up to $1,800, will be awarded annually to a full-time undergraduate female student enrolled in Year Two of a program in which women are underrepresented in the Faculties of Engineering, Mathematics, or Science. Selection is based on academic achievement (minimum 80% cumulative average). This fund is made possible by a donation from Raj (PhD ‘66) and Shanta Dubey to celebrate their 50th wedding anniversary, their commitment to the University of Waterloo, and their dedication to the Waterloo community.

*Method of Financing: endowment*

James Dyson Foundation Upper Year Scholarship
Two scholarships, valued at $2,500 each, will be awarded annually to full-time undergraduate students enrolled in Year Three or Four in the Faculty of Engineering on the basis of academic achievement (minimum 80% cumulative average) and demonstrated interest in the area of entrepreneurship. Interested students should submit an application by October 1. This fund is made possible by a donation from the James Dyson Foundation which is dedicated to encouraging young people to think differently, make mistakes, invent, and realize their engineering potential.

*Method of Financing: annual donation (two-year pledge)*

Trevor H. Edwards Memorial Award
An award, valued at up to $5,000, is available annually for a mature undergraduate student enrolled in full-time degree studies, in any year and program, with little or no previous university-level education, who has returned to school after spending five or more years in the workforce and/or has been away from full-time education for five or more years. Candidates must be Canadian citizens or permanent residents. Selection will be based on academic achievement (minimum 70% overall average or admission average) and the candidate’s ability to demonstrate their ambition to pursue advanced education in order to achieve goals and successes in life. Interested students are asked to apply by submitting a short essay wherein they describe their employment career to date, explain what has driven them to return to school, and how the program at Waterloo will lead to their chosen career path and future aspirations. Previous recipients of this award are not eligible. Applications are due April 15th. This fund is made possible by a donation from the estate of Trevor Edwards, who pursued a university degree later in life, and became an influential architect within the public sector.

*Method of Financing: endowment*

Environment, Resources, and Sustainability Memorial Scholarship
One scholarship, valued at approximately $500, is awarded annually to a full-time undergraduate student enrolled in Year Two, Three, or Four in Environment, Resources, and Sustainability Studies in the Faculty of Environment. Selection is based on academic excellence. This fund is made possible by donations received in memory of deceased students, alumni, faculty, staff, and friends of the School of Environment, Resources, and Sustainability.

*Method of Financing: endowment*
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**Jazz Aviation Pathway Award for Professionalism**
One award, valued at $3,000, will be awarded annually to a full-time undergraduate student enrolled in 3A, 3B, or 4A of the Aviation program in the Faculty of Environment or the Faculty of Science. Selection will be based on academic excellence (minimum 70% cumulative average) combined with involvement in extracurricular or volunteer activities, as well as outstanding contributions to safety, leadership, and professionalism in the area of aviation. Interested students should submit an application by March 1st. This fund is made possible by a donation from Jazz Aviation LP.

*Method of Financing: annual donation (five-year pledge)*

**Jazz Aviation Pathway Award for Professionalism and Diversity**
One award, valued at $3,000, will be awarded annually to a full-time undergraduate student enrolled in 3A, 3B, or 4A of the Aviation program in the Faculty of Environment or the Faculty of Science. Selection will be based on academic excellence (minimum 70% cumulative average) combined with involvement in extracurricular or volunteer activities, as well as outstanding contributions to safety, leadership, and professionalism in the area of aviation. In support of student diversity, preference will be given to students who have self-identified as aboriginal, persons with a disability, visible minorities, or females. Interested students should submit an application by March 1st. This fund is made possible by a donation from Jazz Aviation LP.

*Method of Financing: annual donation (five-year pledge)*

**Konrad Group Women in Technology Scholarship**
A scholarship, valued at $2,000, will be awarded annually to a full-time female undergraduate student enrolled in Year Three or Four in the Faculty of Mathematics. Selection will be made on the basis of academic achievement and a demonstrated interest in pursuing a career in digital technology (i.e., work-term experiences, extracurricular activities, and/or project work). Interested students should submit an application by October 1. This fund is made possible by a donation from the Konrad Group, a global leader in strategy, design, and development services. Konrad Group wants to encourage women to get involved in digital technology and believes that supporting female students interested in those careers is an important way to further that mission.

*Method of Financing: annual donation (five-year pledge)*

**Konrad Group Digital Technology Scholarship**
A scholarship, valued at $2,000, will be awarded annually to a full-time undergraduate student enrolled in Year Three or Four in the Faculty of Mathematics. Selection will be made on the basis of academic achievement and a demonstrated interest in pursuing a career in digital technology (i.e., work-term experiences, extracurricular activities, and/or project work). Interested students should submit an application by October 1. This fund is made possible by a donation from the Konrad Group, a global leader in strategy, design, and development services. Konrad Group wants to encourage students from a variety of educational backgrounds to get involved with digital technology.

*Method of Financing: annual donation (five-year pledge)*
NEW UNDERGRADUATE SCHOLARSHIPS, AWARDS, and BURSARIES
to be added to the UG Awards Database
- submitted for November 14, 2017 meeting of Senate UG Council -

William Medeiros Memorial Scholarship
A scholarship, valued at $2,500, will be awarded annually to a full-time undergraduate student enrolled in Year Two, Three, or Four of Political Science in the Faculty of Arts. Selection will be made on the basis of academic excellence (minimum 80% cumulative average), and demonstrated leadership in extracurricular and/or volunteer activities within the school or community. Preference will be given to students who demonstrate an interest in the legal field, which may be illustrated by having taken specific law courses, membership in related clubs or societies, volunteer work in the legal field, and may include the desire to pursue law school. Interested students should submit an application by February 15. This fund is made possible by a donation from Lisa Coulman (BA ’88, Chartered Accountancy Studies) and family and friends in memory of William Medeiros.

Method of Financing: annual donation (three-year pledge)

Power Engineering Undergraduate Scholarship
Two or more scholarships, valued at $2,000 each, are awarded annually to outstanding undergraduate students enrolled in Year Four of Electrical and Computer Engineering who are registered in at least one fourth-year power engineering elective course. Candidates must have a minimum overall average of 80%. Selection is based on academic achievement in previous power engineering courses.

Method of Financing: endowment

Muhammad Siddiq Sheikh International Bursary
One bursary, valued at $2,000, will be awarded annually to a full-time international undergraduate student enrolled in any year in any Faculty who is in good academic standing, and who has a demonstrated financial need as determined by Waterloo. To be considered, students must complete the International Undergraduate Bursary application by October 15. This fund is made possible by a donation from Faizan Sheikh (BASc ’11) to honour and remember his philanthropic grandfather, Muhammad Siddiq Sheikh.

Method of Financing: annual donation (five-year pledge)

Teva Canada Professional Practice Award
One award, valued at $2,000, is presented annually to a full-time undergraduate student who is entering Year Three of the Pharmacy program in the Faculty of Science. Selection is based on academic achievement (minimum 75% cumulative average) and a demonstrated high level of professional behaviour both within the Professional Practice and Communications curriculum and outside of the classroom. No application is required. Selection will be made by the School of Pharmacy Awards Committee. This fund is made possible by a donation from Teva Canada Ltd.

Method of Financing: annual donation (five-year pledge)

ATHLETIC AWARDS

Beattie Alumni Award
Two awards, valued at $1,000, are given annually: one to a varsity athlete on each of the men’s and women’s volleyball teams. These awards recognize athletic talent and contribution to Warrior Athletics, their team, and the school. This fund is supported by Warrior men’s volleyball alumnus John W. Beattie and Warrior women’s volleyball alumnus Diane L. Beattie.

Method of Financing: annual donation and matching funds (five-year pledge)
NEW UNDERGRADUATE SCHOLARSHIPS, AWARDS, and BURSARIES

to be added to the UG Awards Database

- submitted for November 14, 2017 meeting of Senate UG Council -

**Bondfield Construction Athletic Excellence Award**

One or more awards, valued at up to $4,500, are given to student-athletes on any women’s varsity team. These awards recognize leadership, athletic talent, and contribution to Warrior Athletics, their team, the school and, their community. This fund is supported by Bondfield Construction Company.

*Method of Financing: annual donation and matching funds (two-year pledge)*

**Ryan Butler Memorial Football Excellence Award**

One award, valued at $2,000, is given to a member of the varsity football team, with preference to a student-athlete who is enrolled in a program in the Faculty of Engineering. This award recognizes athletic talent and contribution to Warrior Athletics, their team and the school. This fund is supported by alumnus Tim Jeske, in memory of former Warrior football quarterback Ryan Butler.

*Method of Financing: annual donation and matching funds (five-year pledge)*

**Julie Devenny Memorial Award**

One award, valued at $3,000, will be given to a member of the varsity women’s basketball team. This award recognizes athletic talent and contribution to Warriors Athletics, their team, and the school. This fund is supported by Craig and Lori Nickel in memory of Julie Devenny. Julie starred for the Warrior women’s basketball team from 2001-2005, having been named the Ontario University Athletics (OUA) and Canadian Interuniversity Sport (CIS) rookie of the year in 2002. Julie tragically passed away at 30 years of age, following an inspirational and courageous battle with breast cancer. Julie’s memory lives on through this award.

*Method of Financing: annual donation and matching funds (five-year pledge)*

**Gilbert Athletic Award**

One award, valued at $2,000, or two awards valued at $1,000, will be given to student-athletes who are members of any varsity team. Preference will be given to student-athletes enrolled in a program in the Department of Recreation and Leisure Studies in the Faculty of Applied Health Sciences. This award recognizes athletic talent and contribution to Warrior Athletics, their team and the school. This fund is supported by Warrior football alumnus Chris Gilbert.

*Method of Financing: annual donation and matching funds (five-year pledge)*

**Liut Family Athletic Excellence Award**

One award, valued at $2,000, is given to a student-athlete on any women’s varsity team. This award recognizes athletic talent and contribution to Warrior Athletics, their team, and the school. This fund is supported by alumnus Paul J. Liut and his family.

*Method of Financing: a lump-sum donation and matching funds*

**Men’s Golf Athletic Excellence Award**

One or more awards, valued at $1,000 or more, are given to members of the varsity men’s golf team. This award recognizes athletic talent and contribution to Warrior Athletics, their team and the school. This fund is supported by Warrior men’s golf alumnus Steve Woods.

*Method of Financing: endowment*
NEW UNDERGRADUATE SCHOLARSHIPS, AWARDS, and BURSARIES

to be added to the UG Awards Database
- submitted for November 14, 2017 meeting of Senate UG Council -

Reverend Graham Morbey Football Excellence Award
One award, valued at $4,000, is given to a member of the varsity football team. This award recognizes athletic talent, academic success, and contribution to Warrior Athletics, their team, and the school. This fund is supported by Warrior football alumnus Jonathan Morbey, in honour of his father, Reverend Graham Morbey, who served as a chaplain at the University of Waterloo for over two decades from the late 1980s until the early 2000s.

Method of Financing: annual donation and matching funds (five-year pledge)

Pauline Nickel Memorial Award for Women's Basketball
One or more awards, valued at up to $4,500, will be given to members of the varsity women's basketball team. This award recognizes athletic talent and contribution to Warrior Athletics, their team, and the school. This fund is supported by Paul Nickel, brother of Warrior women's basketball head coach Craig Nickel, in memory of their mother Pauline Nickel.

Method of Financing: annual donation and matching funds (five-year pledge)

Original KW Titans Men's Basketball Team Award
One or more awards, valued at up to $4,500, are given to members of the varsity men's basketball team. This award recognizes athletic talent and dedication to Warrior Athletics, their team, and community through volunteer or other service opportunities. This fund is supported by members of the original KW Titans senior men's basketball team.

Method of Financing: a lump-sum donation and matching funds

Richard Potwarka Memorial Baseball Award
One award, valued at $2,000, or two awards valued at $1,000, are given to members of the varsity baseball team, with preference to a student-athlete from Waterloo Region and further preference to a student-athlete enrolled in a program in the Department of Recreation and Leisure Studies in the Faculty of Applied Health Sciences. This award recognizes athletic talent, academic success, and contribution to Warrior Athletics, their team, and the school. This fund is supported by Warriors baseball alumnus and former head coach, Dr. Luke Potwarka, in memory of his father, who was a passionate supporter of baseball in Waterloo Region and beyond.

Method of Financing: annual donation and matching funds (five-year pledge)

Prudham Family Football Excellence Award
One award, valued at $4,500, is given to a member of the varsity football team. This award recognizes athletic talent and contribution to Warrior Athletics, their team and the school. This fund is supported by alumnus Brian Prudham.

Method of Financing: annual donation and matching funds (four-year pledge)

JS Rancourt Golf Excellence Award
One award valued at $2,000, or two awards valued at $1,000, are given to members of the varsity men's golf team, with preference to a student-athlete who is enrolled in a program in the Faculty of Engineering. This award recognizes athletic talent, academic success, and contribution to Warrior Athletics, their team, and the school. This fund is supported by Warrior men's golf alumnus, JS Rancourt.

Method of Financing: annual donation and matching funds (five-year pledge)
NEW UNDERGRADUATE SCHOLARSHIPS, AWARDS, and BURSARIES
to be added to the UG Awards Database
- submitted for November 14, 2017 meeting of Senate UG Council -

Richard Rank Golf Award
One award valued at $2,000, or two awards valued at $1,000, are given to members of the varsity men’s golf team. Preference will be given to a first-year student athlete from Ontario. This award recognizes athletic talent, academic success, and contribution to Warrior Athletics, their team, and the school. This fund is supported by Warrior men's golf and Warrior men's hockey alumnus, and current NHL referee, Garrett Rank, in memory of his father.

Method of Financing: annual donation and matching funds (five-year pledge)

Vincent Sguigna Football Excellence Award
One award, valued at $4,500, is given to a member of the varsity football team. Preference will be given to a student-athlete who graduated from Sault Ste. Marie High School or who is from northern Ontario. This award recognizes leadership, athletic talent, and contribution to Warrior Athletics, their team, the school, and their community. This fund is supported by Warrior football alumnus Paul Sguigna, in honour of his father.

Method of Financing: annual donation and matching funds (five-year pledge)

Warrior Soccer Excellence Award
One or more awards, valued at up to $4,500, are given to members of the varsity men's and/or varsity women's soccer team. This award recognizes athletic talent and contribution to Warrior Athletics, their team, and the school. This fund is supported by Warrior soccer alumni and friends.

Method of Financing: annual donation and matching funds (pledge period unknown)

Waterloo 10km Classic Cross Country Excellence Award
Two awards, valued at $1,000 each, are given to members of the varsity men's cross country or varsity women's cross country teams. This award recognizes athletic talent and contribution to Warrior Athletics, their team, and the school. This fund is supported by RunWaterloo, organizer of the Waterloo 10km Classic.

Method of Financing: annual donation and matching funds (five-year pledge)

Waterloo Ravens Hockey Athletic Excellence Award
Four awards, valued at $4,500 each, are provided annually to student-athletes: two to members of the women's varsity hockey team and two to members of the men's varsity hockey team. These awards recognize athletic talent, contribution to Warrior Athletics, and contribution to the team and school. This fund is made possible by a donation from the Waterloo Girls Minor Hockey Association (WGMHA).

Method of Financing: annual donation and matching funds (three-year pledge)
NEW UNDERGRADUATE SCHOLARSHIPS, AWARDS, and BURSARIES
to be added to the UG Awards Database
- submitted for November 14, 2017 meeting of Senate UG Council -

INTERNATIONAL EXPERIENCE AWARDS

Engineering International Exchange Award
Up to five awards, valued at $1,000 each, are provided annually to assist undergraduate students enrolled in second, third, or fourth year of any program in the Faculty of Engineering who are participating in an active exchange program between Waterloo and an overseas partner institution. Candidates must have a minimum cumulative academic average of 75%. Preference will be given to students with demonstrated financial need. Interested students should submit the general International Experience Award application by July 15.

Method of Financing: Faculty funds (on-going)

Lenora Hume International Mobility Award
Up to five awards, normally valued at $1,000 each, are provided to undergraduate or graduate students registered full-time in any year in the Faculty of Arts at the University of Waterloo. Students must be participating in an eligible exchange/study abroad program, an eligible international co-op work term, an international internship opportunity, or be conducting research relevant to their program outside of Canada. Preference will be given to students with financial need for the term(s) abroad. Students should apply as soon as they are able to confirm the details of their intended experience by one of the following deadlines: July 15, November 15, or March 15. This fund is made possible by a donation from Lenora Hume in support of Waterloo’s efforts to educate globally literate and world-ready graduates.

Method of Financing: annual donation and matching funds (two-year pledge)
Recognition and Commendation

Fourteen University of Waterloo researchers have been awarded Canada Research Chairs (CRC). They are:

**Applied Health Sciences**
- **Ken Stark** (Kinesiology) – CIHR Renewed Tier 2 CRC in Nutritional Lipidomics ($500,000 over five years)
- **Mark Ferro** (School of Public Health and Health Systems) – CIHR New Tier 2 CRC in Youth Mental Health ($500,000 over five years)

**Arts**
- **Andrew Bauer** (School of Accounting) – SSHRC New Tier 2 CRC in Taxation, Governance and Risk ($500,000 over five years)
- **Kathryn Henne** (Sociology and Legal Studies) – SSHRC New Tier 2 CRC in Biogovernance, Law and Society ($500,000 over five years)

**Engineering**
- **Frank Gu** (Chemical Engineering) – NSERC Renewed Tier 2 CRC in Nanotechnology Engineering ($500,000 over five years)
- **Luis Ricardez Sandoval** (Chemical Engineering) – NSERC New Tier 2 CRC in Multiscale Modelling and Process Systems ($500,000 over five years)
- **Stephen Smith** (Electrical and Computer Engineering) – NSERC New Tier 2 CRC in Autonomous Systems ($500,000 over five years)
- **Lin Tan** (Electrical and Computer Engineering) – NSERC New Tier 2 CRC in Software Dependability ($500,000 over five years)
- **En-hui Yang** (Electrical and Computer Engineering) – NSERC Renewed Tier 1 CRC in Information Theory and Applications ($1.4 million over seven years)
- **Weihua Zhuang** (Electrical and Computer Engineering) – NSERC Renewed Tier 1 CRC in Wireless Communication Networks ($1.4 million over seven years)

**Environment**
- **Christine Dow** (Geography and Environmental Management) – NSERC New Tier 2 CRC in Glacier Hydrology and Ice Dynamics ($500,000 over five years)

**Mathematics**
- **Jun Liu** (Applied Mathematics) – NSERC New Tier 2 CRC in Hybrid Systems and Control ($500,000 over five years)
- **Karen Yeats** (Combinatorics and Optimization) – NSERC New Tier 2 CRC in Combinatorics of Quantum Field Theory ($500,000 over five years)

**Science**
- **Michel Gingras** (Physics and Astronomy) – NSERC Renewed Tier 1 CRC in Condensed Matter Theory and Statistical Mechanics ($1.4 million over seven years)

(adapted from the Daily Bulletin, 7 November 2017)
Howard Armitage, founding director of the Conrad Centre, was recognized with the City of Waterloo’s highest honour, the Waterloo Award. Howard was celebrated for his contributions to the community as a trail-blazer in the education space, an active board member in the non-profit community, and an inspiring teacher. He was recognized for his leadership in the creation of the MBET program, the first business program of its kind in Canada devoted to entrepreneurs. His nominator, Tim Jackson, stated: “Howard personifies the innovation qualities inherent in the Waterloo Award. He is a holistic, big picture thinker whose creative innovations have changed the face of business education.” And, as one of Conrad’s advisory council members described his achievements, “students who come to his program will change industry, they’ll change companies, they’ll change culture.” (adapted from the Daily Bulletin, 21 November 2017)

St. Jerome’s University history professor Whitney Lackenbauer has been selected as the 2017-18 Killam Visiting Scholar at the University of Calgary. The primary purpose of the program is to support advanced education and research at five Canadian Universities, including the University of Calgary. The Killam Visiting Scholar Program annually selects a distinguished scholar to come to the University of Calgary and make “a significant contribution to academic life”, while participating in research and teaching programs of the host department, as well as engaging in their own research. In Lackenbauer’s case, this means pursuing his active research program on historical and contemporary Arctic affairs, guest lecturing in various courses in history, political science, and anthropology, as well as giving public lectures, organizing and participating in workshops, and organizing an international conference on Canada-Russia Arctic relations, which will be held in winter 2018. Lackenbauer is on sabbatical from St. Jerome’s University for the 2017-18 academic year, while in this role. “This release from my regular teaching and service obligations is facilitating an exciting range of research activities,” Lackenbauer explains, who already has nine books and sixteen articles, and book chapters either published in 2017 or slated for publication by the end of this year. Through his research program asking “What Kind of Security for the Arctic?” Professor Lackenbauer will collaborate with University of Calgary colleagues to establish new frameworks for investigating and understanding the changing security landscape in the Arctic. (adapted from the Daily Bulletin, 24 November 2017)

Lyndon Jones, professor at the School of Optometry and Vision Science and director of the Centre for Contact Lens Research, has been awarded a Fellowship of the Canadian Academy of Health Sciences (CAHS). According to the CAHS website, induction into the CAHS as a fellow is considered one of the highest honours within Canada’s academic community. CAHS fellows, who serve as unpaid volunteers, are nominated by their institutions and peers and selected in a competitive process based on their internationally recognized leadership, academic performance, scientific creativity and willingness to serve. Jones is also a fellow and diplomate of the American Academy of Optometry (AAO). He has authored over 300 refereed and professional papers, and given over 700 invited lectures at conferences worldwide. He has been awarded a number of national and international awards, including the 2014 “Glenn Fry Award” from the AAO, 2014 “Donald Korb Award” from the American Optometric Association, 2013 “Max Schapero Award” from the Cornea and Contact Lens Section of the AAO and the 2011 “George Giles Memorial Lectureship” from the British College of Optometrists. (adapted from the Daily Bulletin, 28 November 2017)

On December 2, the recipients of the inaugural 60th Anniversary Alumni Awards were honoured at the President's 60th Anniversary Gala. This was the pinnacle 60th anniversary celebration event for the University and celebrated the award recipients’ extraordinary citizenship to Waterloo. The 60th Anniversary Alumni Awards recognized ten outstanding alumni for their personal commitment and citizenship to Waterloo, building on the legacy of the 50th Anniversary Alumni Award, created by the Alumni Council in 2007. The Alumni Council commissioned an alumni artist, Paul Roorda (BA ’88) to create a piece of art as a memento for each of the recipients.

Awards were given to:
- Robert Ewen (BA ’71)
- Toby Jenkins (BES ’82) and Tom Jenkins (LLD ’13 Honorary)
We thank these outstanding alumni and donors for investing in Waterloo’s future. (adapted from the Daily Bulletin, 4 December 2017)

In honour of the University’s 60th anniversary, the President’s Community Impact Awards were established to recognize those who embody the University’s spirit of innovation and contribute to making Waterloo Region strong and prosperous. At the President’s 60th Gala on Saturday December 2, four recipients were recognized for community excellence. Each recipient received a hand-crafted commemorative art piece by Ontario artist Tara Marsh, designed with swirls of black and gold illustrating the interconnectedness of the university with our community. There were two awards honouring community leaders, who are current University of Waterloo students, faculty or staff making a difference, and two awards for university champions, local residents or organizations championing the impact of the university in our community:

Community Leaders:

Sally Gunz (School of Accounting and Finance)  
Sally has advocated for neighbourhood improvements such as changes to parks and property standards, lobbied against school closures, and tackled drugs, prostitution, and violence by leading a 100-person volunteer Citizens on Patrol program in partnership with Waterloo Regional Police.

Idrisa Pandit (Studies in Islam, Renison University College)  
Idrisa founded Muslim Social Services, an organization that for the past 10 years has served a wide range of needs for families, particularly in light of the influx of Syrian refugees in recent years. A founding member of Interfaith Grand River, her work has been instrumental in breaking barriers to address policy and procedural gaps in service.

University Champions:

Mary Jane Patterson (MES ’01)  
Mary Jane is a longstanding champion of the University of Waterloo, in her role as the Executive Director of the Residential Energy Efficiency Project (REEP), and beyond. She is passionate about supporting Waterloo students who are following in her footsteps as environmental stewards and advocates.

THEMUSEUM

By partnering with UWaterloo in its programs and exhibitions, such as Quantum: The Exhibition and A Case of Celebration with the Waterloo Aboriginal Education Centre, THEMUSEUM aims to inspire the next generation of Innovators and leaders. THEMUSEUM CEO David Marskell accepted the award on behalf of the organization.

Nominations for the next year’s awards will be posted on the Office of the President website in spring 2018. (adapted from the Daily Bulletin, 5 December 2017)

NanoCnet, a science company developing key technology used in consumer electronics, was among the big winners at the Velocity Fund Finals, held November 30, 2017 in the Student Life Centre. Founded by two
graduates of nanotechnology engineering who earned their PhDs at Waterloo, NanoCnet has been working out of the Velocity Science discovery lab on campus to develop highly flexible, conductive and cost effective nanomaterials. They are used in conductive thin films in all electronics, including touch panels, displays, and wearables. In addition to winning one of the grand prizes of $25,000, NanoCnet also won the top hardware prize, worth $10,000. “The current flexible electronics industry is facing major changes. Traditional conductive materials, which are the building blocks of electronics, have serious problems. They are either expensive, non-flexible, or degrade quickly, which limits the performance and form factors of future electronic devices,” said Hadi Hosseinzadeh Khaligh, co-founder and CEO of NanoCnet. “We’re developing a fundamentally different approach using nanotechnology to create a new generation of conductive materials that are easy to fabricate, flexible and 20 times more durable than existing materials on the market.”

The following three companies were also grand-prize winners of $25,000. They will be admitted to the Velocity Garage startup incubator.

- **Envoi** offers retailers infrastructure for same-day delivery in order to meet consumer demand that is not currently fulfilled by traditional courier services.
- **ShiftRide** is an on-demand mobility platform, giving people access to cars shared by car owners nearby.
- **Tabnex** helps businesses make smarter and faster hiring decisions, by providing real-time data and predictive intelligence on candidates who have applied to job opportunities.

An additional ten teams of University of Waterloo students competed for three prizes of $5,000. The winners of the Velocity $5K are:

- **SannTek** is developing a nanotechnology-based sensor to quantify marijuana intoxication.
- **QALM** is a smart stream trap monitoring solution that makes invisible leaks visible.
- **GreenSorbs** is designing a sorbent boom to clean up oil spills using a material made from landfill waste.

(adapted from *Waterloo News*, 1 December 2017)
Further to the June 19, 2017 Report to Senate, two additional new 2017 University Research Chairs have been awarded:

- Guang Gong (electrical and computer engineering)
- Zhou Wang (electrical and computer engineering).

UNIVERSITY RESEARCH CHAIRS

University of Waterloo owes much of its reputation and stature to the quality of its professors and their scholarly accomplishments. University of Waterloo recognizes exceptional achievement and pre-eminence in a particular field of knowledge through the designation 'University Research Chair' - a title which may be held for up to seven years, with the possibility of a re-nomination. A faculty member with this title will receive either a teaching reduction of one course per year or an annual stipend of $10,000, which will be allocated to the Department/School if teaching reduction is chosen. The University Research Chair title and benefits will be relinquished if a Canada Research Chair or other major research chair is awarded.

It is anticipated that there will be a limited number of University Research Chairs; at steady state, the intention is to make at most five appointments each year. The number of appointments will be reviewed annually by the Vice-President Academic & Provost in consultation with Deans' Council and the program will be reviewed after an initial period of five to ten years.

D. George Dixon
Interim Vice-President Academic & Provost
FOR INFORMATION

A. APPOINTMENTS

Adjunct Appointments

Graduate Supervision
DALE, Ann Marie, Associate Professor, School of Public Health and Health Systems, October 15, 2017 – December 31, 2018.

YAZDANI, Amin, Assistant Professor, School of Public Health and Health Systems, October 15, 2017 – December 31, 2018.

Graduate Supervision and Research
CADELL, Susan, Professor, Associate Professor, School of Public Health and Health Systems, January 1, 2018 – December 31, 2022.

JONES-BITTON, Andria, School of Public Health and Health Systems, January 1, 2018 – August 31, 2018.

Adjunct Reappointments
FERGUSON, Glenn, Assistant Professor, School of Public Health and Health Systems, January 1, 2018 – December 31, 2018.

FRIES, Brant, Professor, School of Public Health and Health Systems, January 1, 2018 – June 30, 2020.

MYERS, Anita, Distinguished Professor Emerita, School of Public Health and Health Systems, January 1, 2018 – December 31, 2022.

SUMANTRA, Ray, Professor, School of Public Health and Health Systems, January 1, 2018 – December 31, 2018.

Postdoctoral Fellow Appointments
GOODMAN, Samantha, School of Public Health and Health Systems, October 30, 2017 – October 29, 2019.

HOLLIGAN, Simone, School of Public Health and Health Systems, November 13, 2017 – November 12, 2019.

HUDON, Anne, School of Public Health and Health Systems, September 18, 2017 – September 17, 2019.

PEJHAN, Shabnam, Department of Kinesiology, November 1, 2017 – October 31, 2018.
ZUCKERMAN, Alexandra, School of Public Health and Health Systems, November 13, 2017 – November 12, 2019.

Postdoctoral Fellow Re-appointment
REID-MUSSON, Emily, School of Public Health and Health Systems, November 1, 2017 – September 30, 2019.

ZUJ, Kathryn, Department of Kinesiology, December 1, 2017 – February 28, 2018.

Special Appointments
Graduate Instruction
FELICE, Eric, Co-lecturer, School of Public Health and Health Systems, January 1, 2018 – April 30, 2018.

MOSTAFAPOUR, Mehrnaz, Co-lecturer, School of Public Health and Health Systems, January 1, 2018 – April 30, 2018.

Undergraduate Instruction
BISHOP-WILLIAMS, Katherine, Lecturer, School of Public Health and Health Systems, January 1, 2018 – April 30, 2018.

BROWN, Kristin, Co-lecturer, School of Public Health and Health Systems, January 1, 2018 – April 30, 2018.

COLE, Adam, Co-lecturer, School of Public Health and Health Systems, January 1, 2018 – April 30, 2018.

DOLSON, Mark, Lecturer, School of Public Health and Health Systems, January 1, 2018 – April 30, 2018.

DRIEZEN, Pete, Lecturer, School of Public Health and Health Systems, January 1, 2018 – April 30, 2018.

GHEORGHIU, Cristina, Lecturer, School of Public Health and Health Systems, January 1, 2018 – April 30, 2018.

HOGEVEEN, Sophie, Co-lecturer, School of Public Health and Health Systems, January 1, 2018 – April 30, 2018.

LAMBRAKI, Irene, Lecturer, School of Public Health and Health Systems, January 1, 2018 – April 30, 2018.

MORTON NINOMIYA, Melody, Lecturer, School of Public Health and Health Systems, January 1, 2018 – April 30, 2018.

SATVAT, Elham, Lecturer, School of Public Health and Health Systems, January 1, 2018 – April 30, 2018.
SINN, Chi-Ling Joanna, Co-lecturer, School of Public Health and Health Systems, January 1, 2018 – April 30, 2018.


YAZDANI, Amin, Lecturer, School of Public Health and Health Systems, January 1, 2018 – April 30, 2018.

Visiting Researcher Appointment
ROCHA, Adson Silva, doctoral student from Brazil, School of Public Health and Health Systems, March 15, 2018 – March 15, 2019.

B. ADMINISTRATIVE REAPPOINTMENT
JANES, Craig, Director, School of Public Health and Health Systems, July 1, 2018 – June 30, 2022.

C. CANADA RESEARCH CHAIR REAPPOINTMENT
STARK, Ken, Professor, Canada Research Chair, Tier 2 in Nutritional Lipidomics, Department of Kinesiology, May 1, 2017 – April 30, 2022.

James W.E. Rush, Dean
Faculty of Applied Health Sciences
A. APPOINTMENTS

Visiting Appointment
GIROUX, Henry, Visiting Fellow, Faculty of Arts, Dean of Arts Office, January 1, 2018 to April 30, 2018.

Adjunct Appointments – Instruction
KUNTZ, Carlyanna, Lecturer, Faculty of Arts, January 1, 2018 to April 30, 2018.

KARIMZADA, Muhebullah, Lecturer, Department of Economics, January 1, 2018 to April 30, 2018.

LESICA, Josip, Lecturer, Department of Economics, January 1, 2018 to April 30, 2018.

LI, Bohan, Lecturer, Department of Economics, January 1, 2018 to April 30, 2018.

MORRIELLO, Marisa, Lecturer, School of Accounting and Finance, January 1, 2018 to April 30, 2018.

PATEL, Anita, Lecturer, School of Accounting and Finance, January 1, 2018 to April 30, 2018.

PEROS, Rosemary, Lecturer, Department of Economics, January 1, 2018 to April 30, 2018.

PIERCE, Janet, Lecturer, Department of Economics, January 1, 2018 to April 30, 2018.

WANG, Sining, Lecturer, Department of Economics, January 1, 2018 to April 30, 2018.

WHELAN, Keith, Lecturer, School of Accounting and Finance, January 1, 2018 to April 30, 2018.

Adjunct Appointments – Graduate Supervision
MITCHELL, Audra, Associate Professor, Department of Political Science, September 1, 2017 to August 31, 2020.

REGAN, Joseph, Clinical Supervision, Department of Psychology, September 1, 2017 to August 31, 2018.

ZAYED, Richard, Assistant Professor, Department of Psychology, January 1, 2018 to August 31, 2018.

Adjunct Reappointments – Instruction
ALEKBEROV, Elshan, Lecturer, Department of Economics, January 1, 2018 to April 30, 2018.

BALAISIS, Nicholas, Lecturer, Department of Drama and Speech Communication, January 1, 2018 to April 30, 2018.

BERGSTROM, Anders, Lecturer, Department of Drama and Speech Communication, January 1, 2018 to April 30, 2018.

BRIGGS, Catherine, Lecturer, Department of History, January 1, 2018 to April 30, 2018.
CAMPBELL, Greg, Lecturer, Department of Drama and Speech Communication, January 1, 2018 to December 31, 2018.

CARVER, Matthew, Lecturer, Department of Fine Arts, January 1, 2018 to April 30, 2018.

CHASMAR, Hugh, Lecturer, School of Accounting and Finance, September 1, 2017 to December 31, 2017.

COCARLA, Sasha, Lecturer, Department of Philosophy, January 1, 2018 to April 30, 2018.

D’AMATO, John, Lecturer, School of Accounting and Finance, January 1, 2018 to April 30, 2018.

DE ROOIJ-MOHLE, Margreet, Lecturer, Department of Germanic and Slavic Studies, January 1, 2018 to April 30, 2018.

DOLSON, Mark, Lecturer, Department of Anthropology, January 1, 2018 to April 30, 2018.

DUCHARME, Robert, Lecturer, School of Accounting and Finance, January 1, 2018 to April 30, 2018.

ENNIS, Richard, Lecturer, Department of Psychology, January 1, 2018 to April 30, 2018.

FATIMA, Nafeez, Lecturer, Department of Economics, January 1, 2018 to April 30, 2018.

FERNANDEZ, Stephen, Lecturer, Department of English Language and Literature, January 1, 2018 to April 30, 2018.

GAMEZ, Hector, Lecturer, Department of English Language and Literature, January 1, 2018 to April 30, 2018.

GLADWIN, Derek, Lecturer, Department of English Language and Literature, January 1, 2018 to April 30, 2018.

HANCOCK, Michael, Lecturer, Department of English Language and Literature, January 1, 2018 to April 30, 2018.

HAYES, Nicole, Lecturer, Department of Anthropology, January 1, 2018 to April 30, 2018.

HENRY, George, Lecturer, Department of English Language and Literature, January 1, 2018 to April 30, 2018.

HUNTER, Natalie, Lecturer, Department of Fine Arts, January 1, 2018 to April 30, 2018.

HUTCHISON, Jesse, Lecturer, Department of English Language and Literature, January 1, 2018 to April 30, 2018.

KNOX, Rochelle, Lecturer, Department of Drama and Speech Communication, January 1, 2018 to April 30, 2018.

KUMASE, Wokia, Lecturer, Department of Economics, January 1, 2018 to April 30, 2018.

LEFEBVRE, Benjamin, Lecturer, Department of English Language and Literature, January 1, 2018 to April 30, 2018.
LESIUK, Michael, Lecturer, Department of English Language and Literature, January 1, 2018 to April 30, 2018.

LIAQAT, Zara, Lecturer, Department of Economics, January 1, 2018 to April 30, 2018.

MCCAULEY, Eva, Lecturer, Department of Fine Arts, January 1, 2018 to April 30, 2018.

MEINYKEVYCH, Viktoliya, Lecturer, Department of Germanic and Slavic Studies, January 1, 2018 to April 30, 2018.

MOTA, Fatima, Lecturer, Department of Spanish and Latin American Studies, January 1, 2018 to April 30, 2018.

MURRAY, Neil, Lecturer, Department of Psychology, September 1, 2017 to December 31, 2017.

NABERT-CHUBB, Rebecca, Lecturer, Department of Political Science, January 1, 2018 to April 30, 2018.

NEUPANE, Dhruba, Lecturer, Department of English Language and Literature, January 1, 2018 to April 30, 2018.

OZKARDAS, Ahmet, Lecturer, Department of Economics, January 1, 2018 to April 30, 2018.

PECKHAM, William, Lecturer, Department of Psychology, January 1, 2018 to April 30, 2018.

PREDRAG, Rajsic, Lecturer, Department of Economics, January 1, 2018 to April 30, 2018.

RAHMAN, Fiona, Lecturer, Department of Economics, January 1, 2018 to April 30, 2018.

RAY, Nicholas, Lecturer, Department of Philosophy, January 1, 2018 to April 30, 2018.

RICHARDS, Ted, Lecturer, Department of Philosophy, January 1, 2018 to April 30, 2018.

SABZIAN, Saeed, Lecturer, Department of Economics, January 1, 2018 to April 30, 2018.

SCHWEITZER, David, Lecturer, Department of History, January 1, 2018 to April 30, 2018.

SHAKESPEARE, Robert, Lecturer, Department of English Language and Literature, January 1, 2018 to April 30, 2018.

SHOEMAKER, Corrie, Lecturer, Department of English Language and Literature, January 1, 2018 to April 30, 2018.

SIMEONI, Laura, Lecturer, School of Accounting and Finance, January 1, 2018 to April 30, 2018.

SLETHAUG, Gordon, Professor, Department of English Language and Literature, January 1, 2018 to April 30, 2018.

SNYDER, Carrie, Lecturer, Department of English Language and Literature, January 1, 2018 to April 30, 2018.
SOLEIMANI DAHAJ, Arash, Lecturer, Department of Economics, January 1, 2018 to April 30, 2018.

STACEY, Jeffrey, Lecturer, Department of Drama and Speech Communication, January 1, 2018 to April 30, 2018.

STETTNER, Shannon, Lecturer, Department of Philosophy, January 1, 2018 to April 30, 2018.

STEVENSON, Michael, Lecturer, Department of Political Science, January 1, 2018 to April 30, 2018.

STUMPF, Andrew, Lecturer, Department of Philosophy, January 1, 2018 to April 30, 2018.

WEAVER, Sara, Lecturer, Department of Philosophy, January 1, 2018 to April 30, 2018.

Adjunct Reappointments – Miscellaneous (research, consultations, etc.)
LYONS, Andrew, Professor, Department of Anthropology, December 1, 2017 to November 30, 2019.
LYONS, Harriet, Professor, Department of Anthropology, December 1, 2017 to November 30, 2019.
MACDONALD, Robert, Assistant Professor, Department of Anthropology, September 1, 2017 to August 31, 2020.

Adjunct Reappointments – Graduate Supervision
LIBBY, Theresa, Professor, School of Accounting and Finance, August 1, 2017 to December 31, 2018.
ORR, Elizabeth, Clinical Supervision, Department of Psychology, September 1, 2017 to August 31, 2018.

Graduate Students Appointed as Part-Time Lecturers
BRANCH-SMITH, Teresa, Department of Philosophy, January 1, 2018 to April 30, 2018.
CORNEIL, Rebkka, Department of Germanic and Slavic Studies, January 1, 2018 to April 30, 2018.
DESHANE, Evelyn, Department of English Language and Literature, January 1, 2018 to April 30, 2018.
DEVRIES, Sandra, Department of Philosophy, January 1, 2018 to April 30, 2018.
DRECUN, Darlene, Department of Philosophy, January 1, 2018 to April 30, 2018.
EHRENTRAUT, Judy, Department of English Language and Literature, January 1, 2018 to April 30, 2018.
FREIER, Blake, Department of Philosophy, January 1, 2018 to April 30, 2018.
GERBER, Kyle, Department of English Language and Literature, January 1, 2018 to April 30, 2018.
GIBSON, Ian, Department of English Language and Literature, January 1, 2018 to April 30, 2018.
HOBIN, Nicholas, Department of English Language and Literature, January 1, 2018 to April 30, 2018.
JAFARI, Zahra, Department of English Language and Literature, January 1, 2018 to April 30, 2018.
JORDAN, William, Department of Philosophy, January 1, 2018 to April 30, 2018.
KAMPHERM, Monique, Department of English Language and Literature, January 1, 2018 to April 30, 2018.

KLAUSEN, Catherine, Department of Philosophy, January 1, 2018 to April 30, 2018.

MACDONALD, Ian, Department of Philosophy, January 1, 2018 to April 30, 2018.

MARSH, Sara, Department of Germanic and Slavic Studies, January 1, 2018 to April 30, 2018.

MASCELLA, Allison, Department of Economics, January 1, 2018 to April 30, 2018.

MCCrackin, Sarah, Department of Psychology, January 1, 2018 to April 30, 2018.

MEHRABIAN, Houman, Department of English Language and Literature, January 1, 2018 to April 30, 2018.

MEMARTOLUIE, Ghazal, Department of Economics, January 1, 2018 to April 30, 2018.

MILETIC, Philip, Department of English Language and Literature, January 1, 2018 to April 30, 2018.

MISSAGHIAN, Rod, Department of Sociology and Legal Studies, January 1, 2018 to April 30, 2018.

MORTON, Robert, Department of English Language and Literature, January 1, 2018 to April 30, 2018.

NORTHCOTE, Graeme, Department of English Language and Literature, January 1, 2018 to April 30, 2018.

PABLA, Manjit, Department of Sociology and Legal Studies, October 16, 2017 to December 31, 2017.

PENCOLE, Claire, Department of French Studies, September 1, 2017 to December 31, 2017.

RICHINS, Greg, School of Accounting and Finance, January 1, 2018 to April 30, 2018.

ROWLAND, Samuel, Department of English Language and Literature, January 1, 2018 to April 30, 2018.

SAMUELS, Kanika, Department of Sociology and Legal Studies, November 1, 2017 to December 31, 2017.

SANTOS, Henri Carlo, Department of Psychology, January 1, 2018 to April 30, 2018.

SCHIRM, Ronald Sam, Department of Germanic and Slavic Studies, January 1, 2018 to April 30, 2018.

SEWELL, Jamie, Department of Philosophy, January 1, 2018 to April 30, 2018.

SHORE, Krystle, Department of Sociology and Legal Studies, November 1, 2017 to December 31, 2017.

SILK, Matt, Department of Philosophy, January 1, 2018 to April 30, 2018.

TORBICA, Masa, Department of English Language and Literature, January 1, 2018 to April 30, 2018.
VIST, Mari Elise, Department of English Language and Literature, January 1, 2018 to April 30, 2018.

WILLMOTT, Angela, Department of Sociology and Legal Studies, January 1, 2018 to April 30, 2018.

WONG, Chris, School of Accounting and Finance, January 1, 2018 to April 30, 2018.

XING, Betty, School of Accounting and Finance, January 1, 2018 to April 30, 2018.

**Staff Appointments to Faculty**

DI GRAVIO, Katrina, Lecturer, Department of Psychology, January 1, 2018 to April 30, 2018.

GLOVER, Adam, Lecturer, Department of Fine Arts, January 1, 2018 to April 30, 2018.

**B. ADMINISTRATIVE APPOINTMENTS**

AGER, Sheila, Interim Chair, Department of Fine Arts, November 22, 2017 to June 30, 2018.

CURRY, Phil, Associate Chair, Graduate Studies, Department of Economics, January 1, 2018 to June 30, 2018.

**CHANGE in DATES**

KIRTON, Doug, Chair, Department of Fine Arts, from July 1, 2015 to June 30, 2019 to July 1, 2015 to November 21, 2017.

**C. RETIREMENT**

HELMES-HAYES, Rick, Professor, Department of Sociology and Legal Studies, March 1, 2018.

**D. SABBATICAL LEAVES**

*Approved by the Board of Governors:*

MACDONALD, Shana, Assistant Professor, Department of Drama & Speech Communication, January 1 – June 30, 2018, six months at full salary.

*For approval by the Board of Governors:*

CURRY, Philip, Associate Professor, Department of Economics, September 1, 2018 to August 31, 2019, twelve months at 90.6% salary.

STRATPOULOS, Theo, Associate Professor, School of Accounting and Finance, July 1, 2018 to June 30, 2019, twelve months at full salary.

TOLMIE, Sarah, Associate Professor, Department of English Language and Literature, January 1, 2019 to June 30, 2019, six months at 85% salary.

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Douglas M. Peers
Dean, Faculty of Arts
A. APPOINTMENTS

Probationary Term

MAFTOON, Nima, Assistant Professor, Department of Systems Design Engineering, January 1, 2018 – June 30, 2021. PhD McGill University 2014; MSc Isfahan University of Technology, Iran 2000; BSc University of Tehran, Iran 1997. Dr. Maftoon brings a multifaceted background very fitting to Systems Design Engineering: nine years of industrial experience in research and development in the automotive sector, including strategic planning, policy making, and design. His research focuses on the design and implementation of advanced Bio-devices in the detection, diagnosis and treatment of hearing issues, particularly as related to inner- and middle-ear implants.

Visiting Appointments

ADEY, Bryan, Researcher, Department of Civil & Environmental Engineering, February 11, 2018 – August 12, 2018.

DENG, Chao, Scholar, Department of Systems Design Engineering, December 8, 2017 – November 22, 2018.

FAN, Yuxin, Scholar, Department of Mechanical & Mechatronics Engineering, September 30, 2017 – June 30, 2018.


HAIDO, James, Researcher, Department of Civil & Environmental Engineering, May 1, 2018 – April 30, 2019.

KARIMI Gholamreza, Professor, Department of Chemical Engineering, January 1, 2018 – December 31, 2018.

LI, Longyan, Scholar, Department of Chemical Engineering, February 1, 2018 – February 1, 2019.

LU, Xiaoli, Scholar, Department of Management Sciences, December 30, 2017 – December 29, 2018.

MALANDA TRIGUEROS, Armando, Associate Professor, Department of Systems Design Engineering, July 1, 2018 – January 31, 2019.


SHAVANDI, Hassan, Researcher, Department of Management Sciences, October 1, 2017 – September 30, 2018.
VAN MAI, Hung, Scholar, Department of Chemical Engineering, December 1, 2017 – November 30, 2019.

WANG, Chunlei, Scholar, Department of Electrical & Computer Engineering, October 18, 2017 – October 17, 2018.

XU, Shuhong, Scholar, Department of Electrical & Computer Engineering, October 18, 2017 – October 17, 2018.

YILMAN, Dilara, Researcher, Department of Chemical Engineering, December 1, 2017 – November 30, 2018.


ZHANG, Junyan, Scholar, Department of Mechanical & Mechatronics Engineering, December 31, 2017 – December 30, 2018.

Visiting Reappointments
REHMAN, Abdul, Scholar, Department of Electrical & Computer Engineering, January 1, 2018 – April 30, 2018.

Special Appointments
Undergraduate Instruction
BYSKAL, Daniel, Lecturer, Department of Civil & Environmental Engineering, January 1, 2018 – April 30, 2018.


ELKADRI, Chadi, Lecturer, Department of Management Sciences, January 1, 2018 – April 30, 2018.

GRIFFITHS-FULTON, Karl, Lecturer, Department of Systems Design Engineering, January 1, 2018 – April 30, 2018.

MIKHAILenko, Peter, Lecturer, Department of Civil & Environmental Engineering, January 1, 2018 – April 30, 2018.

MORLEY, Mark, Lecturer, Department of Systems Design Engineering, January 1, 2018 – April 30, 2018.

SHOKRI, Samin, Lecturer, Department of Civil & Environmental Engineering, January 1, 2018 – April 30, 2018.

SOLEIMANI DAHAJ, Arash, Lecturer, Department of Management Sciences, January 1, 2018 – April 30, 2018.

Graduation Instruction
HASSAN, Fathy, Lecturer, Department of Chemical Engineering, September 1, 2017 – December 31, 2017.

Special Reappointments
Undergraduate Instruction
HIASSAT, Abdelhalim, Lecturer, Department of Management Sciences, January 1, 2018 – April 30, 2018.

MAYADUNNE, Anthony, Lecturer, Department of Management Sciences, January 1, 2018 – April 30, 2018.

WASEF, Albert, Lecturer, Department of Electrical & Computer Engineering, January 1, 2018- April 30, 2018.

Special Reappointments
Graduate Instruction
ALLARAKHIA, Minna, Lecturer, Department of Management Sciences, January 1, 2018 – April 30, 2018.

EL REFAI, Ahmed, Lecturer, Department of Civil & Environmental Engineering, January 1, 2018 – April 30, 2018.

FADER, Christina, Lecturer, Department of Management Sciences, January 1, 2018 – April 30, 2018.

Adjunct Appointments
Graduate Supervision and Research
ANIS, Mohab, Associate Professor, Department of Electrical & Computer Engineering, November 1, 2017 – April 30, 2020.

ALARAKHIA, Mohamed, Assistant Professor, Department of Systems Design Engineering, November 15, 2017 – November 14, 2020.

BANISTER, Carsen, Assistant Professor, Department of Mechanical & Mechatronics Engineering, October 10, 2017 – October 9, 2020.


GLINKA, Grzegorz, Professor, Department of Mechanical & Mechatronics Engineering, January 1, 2018 – December 31, 2020.

JOMAAS, Grunde, Professor, Department of Mechanical & Mechatronics Engineering, June 1, 2017 – May 30, 2020.

RYDER, Noah, Professor, Department of Mechanical & Mechatronics Engineering, October 15, 2015 – October 14, 2018.

WONG, Steven, Associate Professor, Department of Electrical & Computer Engineering, November 13, 2017 – November 12, 2020.
Adjunct Appointments
Graduate Supervision
FARD, Ali, Assistant Professor, School of Architecture, September 1, 2017 – December 31, 2017.

GLAWDEL, Tomasz, Assistant Professor, Department of Mechanical & Mechatronics Engineering, June 1, 2017 – May 31, 2020.

MAHMUD, Shohel, Assistant Professor, Department of Mechanical & Mechatronics Engineering, October 1, 2017 – September 30, 2020.

WRIGHT, John, Professor, Department of Mechanical & Mechatronics Engineering, January 1, 2018 – December 31, 2020.

Adjunct Reappointments
Research and Graduate Supervision
ASMAR, Daniel, Associate Professor, Department of Systems Design Engineering, March 1, 2017 – February 29, 2020.

BASHA, Mohamed, Associate Professor, Department of Systems Design Engineering, September 1, 2017 – August 31, 2020.

DE, Mitali, Professor, Department of Systems Design Engineering, September 1, 2017 – August 31, 2020.

MOMTAHAN, Kathryn, Assistant Professor, Department of Systems Design Engineering, January 1, 2018 – December 31, 2020.

REZEQ, Moh’d, Associate Professor, Department of Electrical & Computer Engineering, November 1, 2017 – October 31, 2020.

TORVI, David, Professor, Department of Mechanical & Mechatronics Engineering, November 1, 2017 – October 31, 2020.

UZAROWSKI, Ludomir, Assistant Professor, Department of Civil & Environmental Engineering, August 1, 2017 – July 31, 2019.

Adjunct Reappointments
Graduate Supervision
PANG, Xin, Assistant Professor, Department of Mechanical & Mechatronics Engineering, September 1, 2017 – August 31, 2020.

Cross Appointments
GORBET, Rob, Associate Professor, Department of Knowledge Integration, Faculty of Environment to Department of Electrical & Computer Engineering, November 1, 2017 – April 30, 2020.

Cross Reappointments

CHEN, Helen Hong, Assistant Research Professor, School of Public Health and Health Systems, Faculty of Applied Health Sciences to Department of Systems Design Engineering, November 1, 2017 – October 28, 2019.

HANSSON, Carolyn, Professor, Department of Mechanical & Mechatronics Engineering to Civil and Environmental Engineering, November 1, 2017 – October 31, 2020

NAZAR, Linda, Professor, Department of Chemistry, Faculty of Science to Department of Chemical Engineering, January 1, 2017 – December 31, 2021.

Retirements

GLINKA, Grzegorz, Professor, Department of Mechanical Engineering, December 31, 2017.

VARIN, Robert, Professor, Department of Mechanical & Mechatronics Engineering, November 30, 2017.

WRIGHT, John, Professor, Department of Mechanical & Mechatronics Engineering, December 31, 2017.

Pearl Sullivan
Dean, Faculty of Engineering
FOR INFORMATION

A. APPOINTMENTS

Probationary Term Re-appointment

COLLINS, Andrea, Assistant Professor, School of Environment, Resources and Sustainability, July 1, 2018 to June 30, 2021: PhD, Queen’s University, 2014; MA, Waterloo, 2008; BA, Waterloo, 2006.

Definite Term Appointments

NUGENT, James, Lecturer, Faculty of Environment [80%] and School of Environment, Resources and Sustainability [20%], January 1, 2018 to December 31, 2020: PhD, Toronto, 2017; MA, Toronto, 2009; BSc, Toronto, 2006. Dr. Nugent will deliver core undergraduate courses in the Faculty of Environment [e.g., environmental issues, human ecology, sustainability practice] to large, varied audiences both in-class and online, and will periodically teach international block courses.

O’CONNELL, Erin, Lecturer, Faculty of Environment [80%] and Department of Geography and Environmental Management [20%], January 1, 2018 to December 31, 2020: PhD, Waterloo, 2013; MA, Wilfrid Laurier University, 2008; BEd, University of Western Ontario, 2006; BA, Wilfrid Laurier University, 2005. Dr. O’Connell will deliver core undergraduate courses in the Faculty of Environment [e.g., environmental issues, human ecology, sustainability practice] to large, varied audiences both in-class and online, and will periodically teach international block courses.

Adjunct Appointments

Graduate Supervision

BLYTHE, Jessica, Assistant Professor, Faculty of Environment, November 1, 2017 to December 31, 2019.

CECH, Thomas, Graduate Committee Member, School of Environment, Resources and Sustainability, October 1, 2017 to December 31, 2020.

CHIASSON, Guy, Professor, School of Environment, Resources and Sustainability, September 1, 2017 to August 31, 2018.

DOHERTY, Kevin, Assistant Professor, School of Environment, Resources and Sustainability, April 1, 2017 to December 31, 2020.

MULRENNAN, Monica, Associate Professor, School of Environment, Resources and Sustainability, January 1, 2018 to December 31, 2020.

MURRAY, Daniel, Assistant Professor, School of Environment, Enterprise and Development, November 1, 2017 to April 30, 2018.

POMEROY, John, Professor, Faculty of Environment, December 1, 2017 to November 30, 2021.

STEPHENSON, Robert, Assistant Professor, School of Environment, Resources and Sustainability, October 1, 2017 to December 31, 2020.
Graduate Supervision and Research

ABERNETHY, Paivi, Assistant Professor, School of Environment, Resources and Sustainability, February 1, 2018 to January 30, 2021.

DERKSEN, Christopher, Assistant Professor, Department of Geography and Environmental Management, January 1, 2018 to December 31, 2020.

YOICHI, Kumagai, Assistant Professor, School of Environment, Resources and Sustainability, September 1, 2017 to August 31, 2018.

STOKES, Allyson, Assistant Professor, Department of Knowledge Integration, January 1, 2018 to December 31, 2020.

TUBI, Amit, Lecturer, School of Environment, Resources and Sustainability, October 1, 2017 to December 31, 2020.

Research

PELOFFY, Karine, Business Professional, School of Environment, Resources and Sustainability, October 1, 2017 to December 31, 2020.

Special Appointments

Instruction

BERRY, Peter, Lecturer, Department of Geography and Environmental Management, January 1, 2018 to April 30, 2018.

DOYLE, Lee Anne, Lecturer, School of Planning, September 1, 2017 to April 30, 2018.

JACKSON, John, Lecturer, School of Environment, Resources and Sustainability, January 1, 2018 to April 30, 2018.

JERNIGAN, Ed, Lecturer, Department of Knowledge Integration, January 1, 2018 to April 30, 2018.

MacDONALD, Patricia, Lecturer, School of Environment, Enterprise and Development, January 1, 2018 to April 30, 2018.

MURRAY, Daniel, Lecturer, School of Environment, Enterprise and Development, January 1, 2018 to April 30, 2018.

PENSLAR, Marisa, Lecturer, Department of Geography and Environmental Management, January 1, 2018 to April 30, 2018.

SARKANY, Laszlo, Lecturer, School of Environment, Enterprise and Development, January 1, 2018 to April 30, 2018.

SCHULER, Peter, Lecturer, School of Environment, Resources and Sustainability, January 1, 2018 to April 30, 2018.

Cross Appointment

DRESCHER, Michael, Associate Professor, School of Planning to the School of Environment, Resources and Sustainability, November 1, 2017 to December 31, 2020.
Graduate Students Appointed as Part-Time Lecturers

KEARNEY, Norman, Lecturer, Department of Geography and Environmental Management, January 1, 2018 to April 30, 2018.

WEEDMARK-KISH, Kaitlin, Lecturer, School of Environment, Enterprise and Development, January 1, 2018 to April 30, 2018.

Postdoctoral Fellows Appointed as Part-Time Lecturers

LORENA, Giancarlo, Lecturer, School of Environment, Enterprise and Development, September 1, 2017 to December 31, 2017.

REID-MUSSON, Emily, Lecturer, Department of Geography and Environmental Management, January 1, 2018 to April 30, 2018.

WESTMAN, Linda, Lecturer, Department of Geography and Environmental Management, January 1, 2018 to April 30, 2018.

B. ADMINISTRATIVE APPOINTMENTS

ARMITAGE, Derek, Associate Director, Graduate Studies, School of Environment, Resources and Sustainability, January 1, 2018 to December 31, 2020.

GIBSON, Bob, Acting Associate Director, Graduate Studies, School of Environment, Resources and Sustainability, July 1, 2018 to December 31, 2018.

WANDEL, Johanna, Associate Chair, Undergraduate Studies [Geography Program] Department of Geography and Environmental Management, January 1, 2018 to December 31, 2020.

WOLFE, Sarah, Associate Director, Undergraduate Studies, School of Environment, Resources and Sustainability, January 1, 2019 to December 31, 2021.

ADMINISTRATIVE REAPPOINTMENTS

CLARKE, Amelia, Director, Master of Environment and Business Program, School of Environment, Enterprise and Development, January 1, 2018 to December 31, 2018.

McCARthy, Dan, Associate Director, Undergraduate Studies, School of Environment, Resources and Sustainability, July 1, 2018 to December 31, 2018.

SCOTT, Dan, Director, Interdisciplinary Centre on Climate Change, January 1, 2018 to June 30, 2018.

VINODRAI, Tara, Director, Economic Development and Innovation [MAES], School of Environment, Enterprise and Development, January 1, 2018 to December 31, 2018.

C. SABBATICAL LEAVE

For Approval by the Board of Governors

COLLINS, Andrea, Assistant Professor, School of Environment, Resources and Sustainability, July 1, 2018 to December 31, 2018, at full salary.

CRAIK, Neil, Associate Professor, School of Environment, Enterprise and Development, July 1, 2018 to December 31, 2018, at full salary.
JOHNSON, Peter, Associate Professor, Department of Geography and Environmental Management, January 1, 2019 to June 30, 2019, at 85% salary.

THISTLETHWAITE, Jason, Assistant Professor, School of Environment, Enterprise and Development, March 1, 2018 to August 31, 2018, at full salary.

D. ADMINISTRATIVE LEAVE
   For Approval by the Board of Governors
   CRAIK, Neil, Associate Professor, School of Environment, Enterprise and Development, January 1, 2019 to April 30, 2019, at full salary.

Jean Andrey
Dean
FOR INFORMATION

A. **APPOINTMENTS** (for approval by the Board of Governors)

**Probationary-Term Reappointments**


**RHEBERGEN, Sander**, Assistant Professor, Dept. of Applied Mathematics, July 1, 2018 – June 30, 2021.


**Definite Term - Reappointments**

**ROH, Patrick**, Lecturer, Dept. of Combinatorics and Optimization, May 1, 2018 – April 30, 2019.

**Visiting Appointments**

**BEHZADI, Sima** (Sharif University of Technology), Scholar, Dept. of Applied Mathematics, October 1, 2017 – June 30, 2018.

**FUKASAKU, Ryoya** (Tokyo University of Science), Assistant Professor, David R. Cheriton School of Computer Science, April 1, 2018 – September 15, 2018.

**GUO, Yanni** (Civil Aviation University of China), Visiting Researcher, Dept. of Applied Mathematics, September 1, 2018 – August 31, 2019.


**SCHLUNTZ, Robert**, Research Associate, January 1, 2018 – April 30, 2018.

**ZAFAR JAFARZADEH, Sara**, Researcher, Dept. of Combinatorics and Optimization, November 15, 2017 – April 30, 2018.

**Adjunct Appointments**

**Research**

**BOYKOV, Yuri** (Western University), Professor, January 1, 2018 – June 30, 2018.
LA TORRE, Davide (Nazarbayev University), Professor, Dept. of Applied Mathematics, January 1, 2018 – December 31, 2020.

MOWBRAY, Duncan (Yachay Technical University), Associate Professor, Dept. of Applied Mathematics, September 1, 2017 – August 31, 2020.

YAZDANI, Soroosh, (University of Lethbridge), Assistant Professor, Dept. of Pure Mathematics, September 1, 2017 – August 31, 2020.

**Adjunct Reappointments**

**Instructor**

ALI, Javid, Lecturer, Dept. of Statistics and Actuarial Science, January 1, 2018 – April 30, 2018.

ARNASON, Mark, Lecturer, Office of the Dean, January 1, 2018 – April 30, 2018.

BAER, Jeffrey, Lecturer, Dept. of Statistics and Actuarial Science, January 1, 2018 – April 30, 2018.


BROWN, Janice, Lecturer, David R. Cheriton School of Computer Science, January 1, 2018 – April 30, 2018.

BURGER, Reinhold, Lecturer, David R. Cheriton School of Computer Science, January 1, 2018 – April 30, 2018.

GOH, Joslin, Lecturer, Dept. of Statistics and Actuarial Science, January 1, 2018 – April 30, 2018.

HASAN, Mohammad Khalad, Lecturer, David R. Cheriton School of Computer Science, January 1, 2018 – April 30, 2018.

HOLTBY, Dan, Lecturer, David R. Cheriton School of Computer Science, January 1, 2018 – April 30, 2018.

KHALAR, Rosina, Lecturer, David R. Cheriton School of Computer Science, January 1, 2018 – April 30, 2018.

KOHLER, Dave, Lecturer, Dept. of Statistics and Actuarial Science, January 1, 2018 – April 30, 2018.

LANCOTOT, Kevin, Lecturer, Lecturer, David R. Cheriton School of Computer Science, January 1, 2018 – April 30, 2018.


McKINNON, Jennifer, Lecturer, Office of the Dean, January 1, 2018 – April 30, 2018.

McLEISH, Don, Lecturer, Dept. of Statistics and Actuarial Science, January 1, 2018 – April 30, 2018.
LEE, Brenda, Lecturer, Office of the Dean, January 1, 2018 – April 30, 2018.

MARTINDALE, David, Lecturer, David R. Cheriton School of Computer Science, January 1, 2018 – April 30, 2018.

NIJJAR, Paul, Lecturer, Lecturer, David R. Cheriton School of Computer Science, January 1, 2018 – April 30, 2018.

PUNEET, Sharma, Lecturer, Dept. of Applied Mathematics, January 1, 2018 – April 30, 2018.


SWEENEY, Vincent, Lecturer, Office of the Dean, January 1, 2018 – April 30, 2018.

TAYAL, Aditya, Lecturer, David R. Cheriton School of Computer Science, January 1, 2018 – April 30, 2018.

TURNER, Graeme, Lecturer, Office of the Dean, January 1, 2018 – April 30, 2018.

VENDER, Christine, Lecturer, Office of the Dean, January 1, 2018 – August 31, 2018.

Research


PALDUS, Josef (Professor Emeritus), Dept. of Applied Mathematics, September 1, 2017 – August 31, 2020.


Graduate Students appointed as Part-time Lecturers

DANIELS, Lindsey, Dept. of Applied Mathematics, January 1, 2018 – April 30, 2018.

FAIR, Kathryn, David R. Cheriton School of Computer Science, January 1, 2018 – April 30, 2018.

KUZMINYKH, Anastasia, David R. Cheriton School of Computer Science, January 1, 2018 – April 30, 2018.

MARCO, Shum, David R. Cheriton School of Computer Science, January 1, 2018 – April 30, 2018.

MIOR, Michael, David R. Cheriton School of Computer Science, January 1, 2018 – April 30, 2018.


Graduate Students reappointed as Part-time Lecturers
ARROYO GUEVARA, Alan, Dept. of Combinatorics and Optimization, January 1, 2018 – April 30, 2018.

HACKMAN, Robert, David R. Cheriton School of Computer Science, January 1, 2018 – April 30, 2018.

KHAN, Wasif, David R. Cheriton School of Computer Science, January 1, 2018 – April 30, 2018.

VOELKER, Aaron, David R. Cheriton School of Computer Science, January 1, 2018 – April 30, 2018.

Postdoctoral Fellows appointed as Part-time Lecturers

KINDERMANN, Phillipp, David R. Cheriton School of Computer Science, March 1, 2018 – September 30, 2018.


Postdoctoral Fellow reappointed as part-time Lecturers


B. ADMINISTRATIVE APPOINTMENTS

C. RESIGNATIONS
CHAN, Timothy, Professor, David R. Cheriton School of Computer Science, effective December 31, 2017.

WU, Peng, Visiting Scholar, David R. Cheriton School of Computer Science, effective December 31, 2017.

D. SABBATICALS (for approval by the Board of Governors)
CAI, Jun (Professor, Sept. of Statistics and Actuarial Science), July 1, 2018 – June 30, 2019, with 94.72% salary.

RICE, Gregory (Assistant Professor), Dept. of Statistics and Actuarial Science, July 1, 2018 – December 31, 2018 at 100%. This is a special early sabbatical.

E. SPECIAL LEAVE
LI, JOHNNY SIU-HANG (Associate Professor), Dept. of Statistics and Actuarial Science, July 1, 2018 – June 30, 2019. This is an unpaid leave.

Stephen M. Watt
Dean
UNIVERSITY OF WATERLOO
REPORT OF THE DEAN OF SCIENCE TO SENATE
January 15, 2018

For information:

A. APPOINTMENTS

Adjunct Appointments
Graduate Supervision

BURKHARDT, Pawel, Assistant Professor, Department of Biology, December 1, 2017 to November 30, 2020.

FENTON, Melville Brockett (Brock), Professor, Department of Biology, September 1, 2017 to August 31, 2020.

Research

CHAKRABORTY, Arijit, Assistant Professor, School of Optometry and Vision Science, February 11, 2018 to February 10, 2020.

Undergraduate Instruction

BAHL, Mala, Assistant Professor, School of Pharmacy, November 1, 2017 to October 31, 2020.

Graduate Supervision and Research

CARRASGUILLA ALVAREZ, Juan F., Assistant Professor, Department of Physics and Astronomy, November 1, 2017 to August 31, 2023.

YANG, Huan, Assistant Professor, Department of Physics and Astronomy, September 1, 2017 to August 31, 2022.

ZAIDI, Asif, Assistant Professor, Department of Physics and Astronomy, September 1, 2017 to August 31, 2022.

Graduate Supervision, Research and Other

DRAKE, Andrew R., Assistant Professor, Department of Biology, November 1, 2017 to October 31, 2020.

Adjunct Reappointments
Graduate Supervision

ATKINSON, Gail M., Professor, Department of Earth and Environmental Sciences, October 1, 2017 to September 30, 2020.

BERG, Steven, Assistant Professor, Department of Earth and Environmental Sciences, October 1, 2017 to September 30, 2020.
STEELMAN, Colby, Assistant Professor, Department of Earth and Environmental Sciences, October 1, 2017 to September 30, 2020.

VAN STAAL, Cees, Professor, Department of Earth and Environmental Sciences, November 1, 2017 to October 31, 2020.

WEI, Li, Professor, Department of Physics and Astronomy, September 1, 2017 to August 31, 2022.

Research

CUTLER, Murray, Assistant Professor, School of Pharmacy, December 1, 2017 to November 30, 2020.

PAPASTERGIOU, John, Assistant Professor, School of Pharmacy, November 1, 2017 to October 31, 2020.

SWEETMAN, Jon N., Assistant Professor, Department of Biology, February 1, 2018 to January 31, 2021.

TANG, Anson, Assistant Professor, School of Pharmacy, December 1, 2017 to November 30, 2020.

Undergraduate Instruction

SIAN, Preet, Assistant Professor, School of Pharmacy, January 1, 2018 to December 31, 2020.

Graduate Supervision and Research

ANDREWS, Susan, Professor, Department of Biology, September 1, 2017 to August 31, 2020.

HÉROGUEZ, Valérie, Professor, Department of Chemistry, September 1, 2017 to August 31, 2020.

JOHNSON, Matthew C., Associate Professor, Department of Physics and Astronomy, September 1, 2017 to August 31, 2022.

McCANNA, David J., Assistant Professor, School of Optometry and Vision Science, December 1, 2017 to November 30, 2020.

MUIR, Andrew M., Professor, Department of Biology, January 1, 2018 to December 31, 2020.

NORWOOD, Warren P., Assistant Professor, Department of Biology, November 1, 2017 to October 31, 2020.

WASOWICZ, Marcin, Professor, Department of Chemistry, September 1, 2017 to August 31, 2020.

WATSON, Susan, Professor, Department of Biology, July 1, 2017 to June 30, 2020.

ZIMMERMAN, Christian, Assistant Professor, Department of Biology, January 1, 2018 to December 31, 2020.
Special Reappointment

Undergraduate Instruction

WILSON, Graham, Lecturer, Faculty of Science, March 1, 2018 to June 30, 2018.

Research Associate Reappointed as Part-time Lecturer

VARIKOOTY, Jalaiah P., Lecturer, School of Optometry and Vision Science, January 1, 2018 to April 30, 2018.

Change in Appointment

DIXON, D. George, Adjunct Professor, Department of Biology, dates changed from July 1, 2017 to June 30, 2018 to July 1, 2017 to June 30, 2020.

B. ADMINISTRATIVE REAPPOINTMENTS

POWER, William, Chair, Department of Chemistry, September 1, 2018 to August 31, 2022.

C. RETIREMENTS

ORCHARD, Ian, Professor, Department of Biology, effective January 1, 2018.

FOR APPROVAL BY THE BOARD OF GOVERNORS

D. SABBATICAL

HRYNCHAK, Patricia, Clinical Professor, School of Optometry and Vision Science, September 1, 2018 to August 31, 2019, 100% salary arrangements.

R.P. Lemieux
Dean of Science
FOR APPROVAL

Committee Appointments

Motion: To approve the following appointments:

- **Amit and Meena Chakma Awards for Exceptional Teaching by a Student Committee:** Leia Minaker (planning) as faculty representative, term to 31 December 2018.

- **Distinguished Teacher Awards Committee:** Firas Mansour (physics & astronomy) as faculty representative, and Tiffany Bradley as alumni representative, terms to 31 December 2019.
The position of “Associate Provost, Resources” is being eliminated, and with the establishment of the position of “Deputy Provost, Integrated Planning and Budgeting”, it is proposed that Senate Bylaw 4: a bylaw relating to the naming of additional ex officio members of Senate of the University of Waterloo (Attachment #1) be amended. The proposed change does not change the constituency ratios and so there are no other changes necessary to Senate representation.

There are a number of other small housekeeping items as a result of this change, and to other titles in all of Senate’s bylaws (Attachments #2, 3, and 4).

In accordance with Section 14* of Bylaw 1: A bylaw relating generally to the business and affairs of Senate of the University of Waterloo, and its committees and councils, the bylaw changes were recommended to Senate for first reading at the 20 November 2017 meeting, and are recommended to Senate for second reading at the 15 January 2018 meeting.

For Approval

Motion: That Senate approve the proposed bylaw changes at Senate’s 15 January 2018 meeting.

*The passage of a new bylaw or amendment(s) to an existing bylaw is accomplished in two readings by Senate. At the first reading, such discussion as is deemed appropriate by Senate shall take place. At the second reading, further discussion may take place and the vote on the document shall be taken. The two readings shall take place at different, but not necessarily consecutive, meetings of Senate.

Feridun Hamdullahpur
President
Senate Bylaw 4

A bylaw relating to the naming of additional ex officio members of Senate of the University of Waterloo.

BE IT ENACTED as a bylaw of Senate of the University of Waterloo, as follows:

1. Ex officio members

WHEREAS The University of Waterloo Act, 1972 provides in section 18.a.9 that Senate of the university may add to its membership such other ex officio members as Senate by bylaw may, from time to time, designate; and

WHEREAS The University of Waterloo Act, 1972 provides in section 18.b.2 that elected members of the faculty shall equal in number one more than the total number of all other members of Senate; and

WHEREAS The University of Waterloo Act, 1972 provides in section 18.c. that upon the designation of and addition, from time to time, by Senate of any additional ex officio members, the number of elected members from the Board of Governors, the undergraduate students, the graduate students and the alumni shall be increased by whatever numbers are necessary to retain the ratios, in each case, of the number of such elected persons to the number of elected faculty.

BE IT THEREFORE enacted as a bylaw of Senate of the University of Waterloo as follows:

That the following be named as ex officio members of Senate:

a. The vice-president, advancement.
b. The vice-president, university relations.
c. The vice-president, university research.
d. The associate vice-president, academic.
e. The associate provost, resources.
f. The deputy provost, integrated planning and budgeting
g. The president of the Faculty Association of the University of Waterloo.
h. The president of the Federation of Students, University of Waterloo.

That the chief returning officer be empowered upon passage of this bylaw to take whatever steps are necessary to carry out such elections or by-elections as may be necessary to comply with the provisions of The University of Waterloo Act, 1972, cited above and arising from the designation of ex officio members of Senate by the passage or amendment of this bylaw.

Approved by Senate 20 May 1975.
Amended by Senate in two readings, December 1980 and January 1981.
Amended by Senate in two readings, December 1983 and January 1984.
Amended by Senate in two readings, May and June 1987.
Amended by Senate in two readings, May and June 1990.
Amended by Senate in two readings, October and November 2012.
Amended by Senate in two readings, November 2013 and January 2014.
Amended from Bylaw 11 by Senate in two readings, September and October 2014.
Amended by Senate in two readings, March and May 2015.
Senate Executive Committee
Report to Senate – 15 January 2018

**Senate Bylaw 1**

A bylaw relating generally to the business and affairs of Senate of the University of Waterloo, and its Committees and Councils.

BE IT ENACTED as a bylaw of Senate of the University of Waterloo, as follows:

1. **Interpretation**

   1.01 In all the bylaws of Senate,

   a. “academic year” means the twelve-month period dating from 1 May of one year to 30 April of the succeeding year.

   b. “Senate” means Senate of the University of Waterloo.

   c. “Executive Committee” means the Executive Committee of Senate as established in the Senate bylaws.

   1.02 Throughout all the bylaws of Senate of the University of Waterloo:

   a. Where the title “president” appears, an acting president or president pro tem, so designated by the Board of Governors, shall serve in the place of the president, with the latter’s full rights and responsibilities.

   b. Where the title “vice-president, academic & provost” appears, an acting vice-president, academic & provost or vice-president, academic & provost pro tem, so designated by the president and/or the Board of Governors, shall serve in the place of the vice-president, academic & provost, with the latter’s full rights and responsibilities.

   c. Where the title “vice-president, administration & finance” appears, an acting vice-president, administration & finance or vice-president, administration & finance pro tem, so designated by the president, shall serve in the place of the vice-president, administration & finance, with the latter’s full rights and responsibilities.

   d. Where the title “vice-president, advancement” appears, an acting vice-president, advancement or vice-president, advancement pro tem, so designated by the president, shall serve in the place of the vice-president, advancement, with the latter’s full rights and responsibilities.

   e. Where the title “vice-president, university relations” appears, an acting vice-president, university relations or vice-president, university relations pro tem, so designated by the president, shall serve in the place of the vice-president, university relations, with the latter’s full rights and responsibilities.

   f. Where the title “vice-president, university research” appears, an acting vice-president, university research or vice-president, university research pro tem, so designated by the president and/or the Board of Governors, shall serve in the place of the vice-president, university research, with the latter’s full rights and responsibilities.

   g. Where the title “associate vice-president, academic” appears, an acting associate vice-president, academic or associate vice-president, academic pro tem, so named to serve by the president, shall serve in the place of the associate vice-president, academic, with the latter’s full rights and responsibilities.

   h. Where the title “associate provost, graduate studies and postdoctoral affairs” appears, an acting associate provost, graduate studies and postdoctoral affairs or associate provost, graduate studies and postdoctoral affairs pro tem, so named to serve by the president, shall serve in the place of the associate provost, graduate studies and postdoctoral affairs.
president, graduate studies and postdoctoral affairs, with the latter’s full rights and responsibilities.

i. Where the title “associate provost, resources” “deputy provost, integrated planning and budgeting” appears, an acting associate provost, resources deputy provost, integrated planning and budgeting or associate provost, resources deputy provost, integrated planning and budgeting pro tem, so designated by the president, shall serve in the place of the associate provost, resources deputy provost, integrated planning and budgeting, with the latter’s full rights and responsibilities.

j. Where the titles “dean of each faculty” appear, an acting dean, or dean pro tem, so named to serve by the vice-president, academic & provost, shall serve in the place of the dean, with the latter’s full rights and responsibilities.

2. Schedule of meetings

2.01 The schedule of meetings for Senate and its committees and councils shall be approved by the chair of Senate and published by the Secretariat & Office of General Counsel prior to the new academic year.

3. Meetings of Senate

3.01 General meetings

Senate shall normally hold ten (10) general meetings during each academic year. Notice of each meeting shall be communicated to the university community in such places and ways as may be designated from time to time by Senate.

3.02 Place of meetings

Meetings of Senate shall be held upon the campus of the university.

3.03 Notice of an agenda and background material for general meetings

Notice in writing of each general meeting and the agenda and available background material for any such meeting, shall be available to all members of Senate at least seven (7) days prior to the date of each such meeting.

3.04 Special meetings

Special meetings of Senate shall be called by one of the following:

The chair of Senate, upon the receipt of a request of the Executive Committee for such meeting; or

The secretary of Senate, upon receipt by the secretary of a written request for such meeting signed by at least twenty (20) members of Senate, with such request to state the reason for calling the special meeting.

Special meetings shall be called promptly.

Notice in writing of each special meeting, together with the agenda and available background material shall be available to each member of Senate at least seven (7) days prior to the date of the meeting, provided that the chair of Senate shall have the power and authority to abridge such seven-
day period when, in the chair’s absolute discretion, the urgency of any item of business to be dealt with at such meeting so requires.

Notice in writing of each special meeting shall be communicated to the university community in such places and ways as may be designated from time to time by Senate.

4. Committees and councils - agenda and background material to be available

4.01 Notice in writing of each general meeting of any committee or council shall be available at least seven (7) days prior to the date of each such meeting.

4.02 The agenda and available background material for any general meeting of any committee or council shall be available at least seven (7) days prior to the date of each such meeting.

5. Quorum

5.01 At all meetings of Senate and of its committees and councils, a majority of the members shall constitute a quorum for the transaction of the business and affairs of the body.

6. Meetings in open session

6.01 Subject to section 7 of this bylaw, all general and special meetings of Senate and its committees and councils shall be open to members of the university community, the public-at-large, and representatives of the news media. Senate will make every effort to hold its meetings in a room sufficiently large to accommodate those who indicate to the secretary of Senate, two full working days in advance of the meeting, their desire to attend.

6.02 Non-members in attendance at meetings shall not disrupt the proceedings of the meeting nor cause any disturbance by unreasonable noise or vocal expression. The chair may remove any such person when, in the chair’s sole judgment, such person is engaging in improper or disruptive conduct that is detrimental to Senate carrying out its business.

7. Meetings in closed session

7.01 Notwithstanding the provisions of section 6 of this bylaw, and provided that all meetings shall begin in open session, Senate and its committees and councils shall have the right to hold any meeting or part thereof in closed session. This provision may exclude therefrom all persons, save for members and such resource persons as may be agreed should be in attendance, for the purpose of considering confidential financial matters of the university or where intimate financial or personal matters of any person may be disclosed, unless such person requests that such part of the meeting be open to the public.

The Executive Committee shall determine for purposes of the Senate agenda whether any matter is of a confidential nature and such matter shall be so designated on the agenda for such Senate meeting and shall be designated and described in a manner consistent with maintaining the confidentiality of such matter.

The chair or chair(s) of any committee or council of Senate will determine whether any matter is of a confidential nature and such matter shall be so designated on the agenda for such meeting and
shall be designated and described in a manner consistent with maintaining the confidentiality of such matter. Senate or its committees or councils shall initially deal with any such confidential matter in closed session, but, after receiving the pertinent information relative to the confidential matter, may direct that the matter be thereupon considered in open session.

8. Declarations of conflict of interest

8.01 At the beginning of each meeting of Senate or any of Senate’s committees or councils, the chair will call for members to declare any conflicts of interest with regard to any agenda item. For agenda items to be discussed in closed session, the chair will call for declarations of conflict of interest at the beginning of the closed portion of the meeting. Members may nonetheless declare conflicts at any time during a meeting.

8.02 A member shall be considered to have an actual, perceived or potential conflict of interest, when the opportunity exists for the member to use confidential information gained as a member of Senate, or any of Senate’s committees or councils, for the personal profit or advantage of any person, or use the authority, knowledge or influence of the Senate, or a committee or council thereof, to further her/his personal, familial or corporate interests or the interests of an employee of the university with whom the member has a marital, familial or sexual relationship.

8.03 Members who declare conflicts of interest shall not enter into debate nor vote upon the specified item upon which they have declared a conflict of interest. The chair will determine whether it is appropriate for said member to remove themselves from the meeting for the duration of debate on the specified item(s).

8.04 Where Senate or a committee or council of Senate is of the opinion that a conflict of interest exists that has not been declared, the body may declare by a resolution carried by two-thirds of its members present at the meeting that a conflict of interest exists and a member thus found to be in conflict shall not enter into debate on the specified item upon which they have declared a conflict of interest. The chair will determine whether it is appropriate for said member to remove themselves from the meeting for the duration of debate on the specified item(s).

9. Representations to meetings

9.01 Any members of the university community, or of the public-at-large, wishing to make representations to any meeting of a committee or council shall file with the secretary of the relevant committee or council, at least two full working days prior to the date of such proposed meeting, written notice to that effect with such notice to designate the nature of the proposed representations.

10. Time limit on representations

10.01 The chair of any committee or council may limit the time to be allotted to members of the university community and the public-at-large for committee or council representations.

11. Secretary

11.01 The university secretary and general counsel (USGC) of the university shall be the non-voting secretary of Senate.
11.02 The USGC university secretary shall appoint one or more associate secretaries of Senate to act as secretary of Senate in the absence of the USGC university secretary.

11.03 The USGC university secretary, or designate, shall be the non-voting secretary of each committee or council of Senate.

12. Limit on service on committees

12.01 An elected member of Senate shall not serve on more than one of the Executive, Finance or Long Range Planning Committees.

13. Term of office

13.01 Except where specified by Senate bylaws, the term of office on committees or councils shall be one year, with members eligible for re-election.

14. Bylaws - general

14.01 The passage of a new bylaw or amendment(s) to an existing bylaw is accomplished in two readings by Senate. At the first reading, such discussion as is deemed appropriate by Senate shall take place. At the second reading, further discussion may take place and the vote on the document shall be taken. The two readings shall take place at different, but not necessarily consecutive, meetings of Senate.

14.02 No proposed bylaw or amendment(s) will be given reading unless it has been bound into or accompanies the agenda portfolio distributed in advance of the meeting.

14.03 Any proposed bylaw or amendment(s) shall include the proposed wording of the bylaw or amendment(s), and where appropriate, a summary of the reasons for such bylaw or amendment(s).

14.04 In order to be approved by Senate, any new bylaw or amendment(s) to bylaws must receive the affirmative vote of at least two-thirds of the members of Senate present and voting at the meeting.

15. Faculty constitutions

15.01 Each faculty and each academic department and school of the university may adopt a formal constitution governing its operations, provided that each such constitution and any amendments thereto shall be inoperative and ineffective until approved by Senate. No provision of the constitutions shall be inconsistent with any provisions of The University of Waterloo Act, 1972, as amended, and no provision of any constitution shall be exempt from the provisions of any of the bylaws or established policies of the university which are within the final jurisdiction of Senate, except as expressly approved by Senate.

Amended/consolidated from Bylaws 1, 6, 7, and 10 in two readings in September and October 2014.
Senate Bylaw 2

A bylaw to establish Committees and Councils of Senate of the University of Waterloo.

BE IT ENACTED as a bylaw of Senate of the University of Waterloo, as follows:

1. Executive Committee

1.01 There shall be a standing committee of Senate called the Executive Committee.

1.02 **Executive Committee Membership**

The membership of this committee shall consist of the following:

*Ex Officio*

The president of the university, who shall chair this committee.
The vice-president, academic & provost.
The associate provost, graduate studies. associate vice-president, graduate studies and postdoctoral affairs
The president of the Faculty Association of the University of Waterloo.

Elected

One faculty member of Senate from each faculty of the university.
Three members from the student members of Senate, at least one of whom shall be an undergraduate student and at least one of whom shall be a graduate student.
One member of Senate from among the community-at-large members of the Board of Governors.
One faculty member of Senate from the affiliated and federated institutions of Waterloo.
One member from among the alumni members of Senate.

1.03 The term of office of members elected pursuant to paragraph 1.02.b shall be one year. Each member is eligible for re-election.

1.04 **Powers and duties of Executive Committee**

The Executive Committee shall have the following powers and duties:

To request special meetings of Senate, in accordance with Senate Bylaw 1.
On those occasions when the agenda does not, in the estimation of the Executive Committee, warrant a meeting of Senate, to cancel any such meeting of Senate, and to exercise the powers of Senate, within the limits of *The University of Waterloo Act, 1972*, on all matters considered by the Executive Committee in its discretion to be of sufficient urgency that they must be decided prior to the next regular meeting of Senate, provided that the Executive Committee shall have no power under any circumstances to repeal, amend or modify Senate bylaws, or to exercise Senate’s responsibilities under Policies 45, 48, 50 and 68. All such actions are to be reported to Senate.
To prepare the agenda for all regular and special meetings of Senate.
To receive and review reports from the deans of the university prior to their submission to Senate at each regular meeting.
To present to Senate, normally at the last regular meeting in the academic year in April, a list of nominations for the committees and councils of Senate.
To make recommendations to Senate as may be necessary from time to time regarding the establishment of ad hoc committees of Senate, such recommendations to include the terms of reference of any such committee and a list of nominations for the membership thereof. To receive and review the reports and recommendations of all committees and councils, prior to their presentation to Senate and to make at its discretion recommendations to Senate thereon. To act on behalf of Senate on such matters as Senate may from time to time designate. To report to Senate, as expeditiously as possible, with respect to the conduct of such matters as shall be delegated by Senate to the committee from time to time.

### 1.05 Meetings of the Executive Committee

The committee shall normally hold ten (10) regular meetings during each academic year, each such meeting to be held approximately two weeks prior to the date of each general meeting of Senate. Special meetings of the committee shall be called by the chair of the committee.

### 2. Finance Committee

2.01 There shall be a standing committee of Senate called the Finance Committee.

2.02 **Finance Committee Membership**

The membership of this committee shall consist of the following:

*Ex Officio*

- The president of the university, who shall chair this committee.
- The vice-president, academic & provost.
- The vice-president, administration & finance.
- The vice-president, university research.
- The associate provost, graduate studies. associate vice-president, graduate studies and postdoctoral affairs
- The associate provost, resources. deputy provost, integrated planning and budgeting
- The dean of each faculty.

*Elected*

- One member from the community-at-large members of the Board of Governors.
- One elected faculty member of Senate from each faculty and one faculty member of Senate from the affiliated and federated institutions of Waterloo.
- Three members from the elected student members of Senate, at least one of whom shall be an undergraduate student and at least one of whom shall be a graduate student.
- One member from among the alumni members of Senate.

2.03 The term of office of members elected pursuant to paragraph 2.02.b shall be one year. Each member is eligible for re-election.

2.04 **Powers and Duties of Finance Committee**

The Finance Committee shall have the following powers and duties:

- To consider, study, and review all matters pertaining to the financial operations of the university and to make recommendations to Senate thereon.
To consider, study, and review the general policies governing the internal allocation of the university’s financial resources and to make recommendations to Senate thereon.
To receive each year from the vice-president, academic & provost, for consideration, study, and review, on behalf of Senate, a detailed operating budget for the university and to make recommendations to Senate thereon.

3. Long Range Planning Committee

3.01 There shall be a standing committee of Senate called the Long Range Planning Committee.

3.02 **Long Range Planning Committee Membership**

The membership of this committee shall consist of the following:

*Ex Officio*

The president of the university.
The vice-president, academic & provost, who shall chair this committee.
The vice-president, administration & finance.
The vice-president, university research.
The associate provost, graduate studies, associate vice-president, graduate studies and postdoctoral affairs.
The dean of each faculty.

*Elected*

One elected faculty member of Senate from each faculty and one faculty member of Senate from the affiliated and federated institutions of Waterloo.
One member from the Board of Directors of the Faculty Association of the University of Waterloo.
Three members of Senate from the elected student members, at least one of whom shall be an undergraduate student and at least one of whom shall be a graduate student.
One member of Senate from the community-at-large members of the Board of Governors.
One member from among the alumni members of Senate.

3.03 The term of office of members elected pursuant to paragraph 3.02.b shall be one year. Each member is eligible for re-election.

3.04 **Powers and duties of Long Range Planning Committee**

The Long Range Planning Committee shall have the following powers and duties:

To make recommendations to Senate in all matters pertaining to the co-ordination of the planning of the academic, physical, and operational development of the university and the achievement of a planned rate and scope of such development.
To receive from the president, for consideration, study and review, on behalf of Senate, plans for the development of the university and to make recommendations to Senate thereon.
To undertake such studies as Senate may designate from time to time.
To report to Senate, as expeditiously as possible, with respect to the conduct of such matters as shall be delegated by Senate to the committee from time to time.
### 4. Graduate & Research Council

<table>
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<tr>
<th>4.01</th>
<th>There shall be a council of the university, appointed by and responsible to Senate, called the Graduate &amp; Research Council.</th>
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| 4.02 | **Graduate & Research Council Membership**  

The membership of this council shall consist of the following:

**Ex Officio**

- The president of the university.
- The vice-president, academic & provost.
- The vice-president, university research, who shall co-chair this council.
- The associate provost, graduate studies, associate vice-president, graduate studies and postdoctoral affairs, who shall co-chair this committee.
- The associate dean of graduate studies in the graduate studies and postdoctoral affairs office.
- The associate vice-president, university research.
- The associate vice-president, external research.
- The chief ethics officer.
- The director, research partnerships.
- The director, graduate academic services.
- The university librarian, or designate.
- The president of the Graduate Student Association.

**Elected / Appointed**

- Two faculty members with Approved Doctoral Dissertation Supervisor status from each faculty, one of whom must be an associate dean with a research and/or graduate studies portfolio. Associate deans serve without term limits; others serve for a two-year term.
- One faculty member from the affiliated and federated institutions of Waterloo, who shall serve for a term of two years.
- One graduate student from each faculty, each of whom shall serve for a term of two years.

| 4.03 | **Powers and Duties of the Graduate & Research Council**

The Graduate & Research Council shall consider all questions relating to the academic quality of graduate studies and research activity within the university and, without intending to restrict the generality of the foregoing, the Graduate & Research Council shall,

- Make recommendations to Senate with respect to the government, direction and management of, or any changes in rules, regulations or policies for graduate studies and research in the university.
- Advise the vice-president, academic & provost on all matters relating to graduate studies and research.
- Receive, consider, study and review briefs on any aspect of graduate studies and research from members of the university.
- Make recommendations to Senate with respect to any financial matter pertaining to graduate studies and research.
- Consider, study and review all proposals for new graduate programs, the deletion of graduate programs, major changes to existing graduate programs, arrange for internal appraisals as the council shall see fit, and make recommendations to Senate thereon.
On behalf of Senate, consider and approve all new graduate courses, the deletion of graduate courses, and proposed minor changes to existing graduate courses and programs, and provide Senate with a brief summary of council’s deliberations in this regard. Any matter of controversy that might arise may be referred to Senate.
Consider, study and review all proposals for new centres and institutes, and the closure of centres and institutes, and make recommendations to Senate thereon.
On behalf of Senate, consider and approve renewals for centres and institutes, and report such renewals to Senate for information. Any matter of controversy that might arise may be referred to Senate.
On behalf of Senate, consider and approve all new graduate scholarships and awards. Any matter of controversy that might arise may be referred to Senate.

5. Undergraduate Council

5.01 There shall be a council of the university, appointed by and responsible to Senate, called the Undergraduate Council.

5.02 **Undergraduate Council Membership**

   The membership of this council shall consist of the following:

   **Ex Officio**

   The president of the university.
   The vice-president, academic & provost.
   The associate vice-president, academic, who shall co-chair this council.
   The dean of the federated university.
   The associate dean for undergraduate studies for each faculty.
   The registrar of the university.
   The university librarian, or delegate.
   The vice-president (education) or equivalent from the Undergraduate Student Association of each faculty of the university.

   **Elected / Appointed**

   One member of the faculty from each faculty of the university which offers undergraduate programs, each of whom shall serve for a term of two years.
   One member of faculty from the federated university, who shall serve for a term of two years.
   One member of faculty from the affiliated university colleges, who shall serve for a term of two years.
   A director appointed from Co-operative Education & Career Action.
   An executive member appointed from the Federation of Students.

5.03 **Powers and Duties of the Undergraduate Council**

   The Undergraduate Council shall consider all questions relating to the academic quality of undergraduate studies within the university and, without intending to restrict the generality of the foregoing, the Undergraduate Council shall,
| Make recommendations to Senate with respect to rules and regulations for the government, direction and management of undergraduate studies in the university. |
| Make recommendations to Senate with respect to new undergraduate programs/plans, the deletion of undergraduate programs/plans, and major changes to undergraduate programs/plans. |
| On behalf of Senate, consider and approve all new undergraduate courses, the deletion of undergraduate courses, and proposed changes to existing undergraduate courses and minor changes to programs and/or plans, and provide Senate with a summary of council’s deliberations in this regard. Any matter of controversy that might arise may be referred to Senate. |
| Advise the vice-president, academic & provost on all matters relating to undergraduate studies. Consider, study and review briefs on any aspect of undergraduate studies from members of the university. |

Amended/consolidated from Bylaws 2, 3, 4, 8 and 9 in two readings, September and October 2014.
Senate Bylaw 3

A bylaw relating to the selection of members of Senate of the University of Waterloo.

BE IT ENACTED as a bylaw of the University of Waterloo, as follows:

1. Chief Returning Officer

   1.01 The university secretary & general counsel (USGC) or designate shall act as chief returning officer for the purpose of conducting the election of members of Senate. As chief returning officer, the USGC university secretary or designate has overall responsibility for the general conduct of such elections and by-elections, which shall be by secret ballot. Without restricting the generality of the foregoing, the chief returning officer shall:

   - Establish the timing of Senate elections and by-elections, subject to the provisions described in sections 2.01 and 2.03 below.
   - Call for nominations and when doing so inform the university community of the names of those members of Senate whose terms of office expire on 30 April of that year and whether such members are eligible for a further term of service.
   - Verify the eligibility of nominees and nominators.
   - For undergraduate student elections, provide nomination information to the Federation of Students Election Committee.
   - Distribute ballots and balloting information to eligible voters, allowing at least one week for the polling period.
   - Announce the results to the university community, and resolve ties, as necessary.

2. Elections

   2.01 The election of faculty and student members to Senate shall be completed by the regular March meeting of Senate each year. Undergraduate student elections shall be held in conjunction with the annual elections conducted by the Federation of Students in February. Faculty and graduate student elections are conducted by the Secretariat & Office of General Counsel.

   The nomination period for faculty constituencies and graduate students is at least twenty-one (21) days. For undergraduate student constituencies, the nomination period is determined in consultation with the Federation of Students. The chief returning officer shall call for nominations from those faculty and student constituencies that have members whose terms are expiring by placing a suitable notice in such places and ways as may be designated from time to time by Senate, with copies to the appropriate faculties and constituency presidents. Nomination forms shall be made available by the Secretariat & Office of General Counsel. Nominations shall be submitted in writing to the chief returning officer. Each nomination shall be signed by the required number of members of the constituency from which the member is to be elected and shall include a signed statement from the nominee agreeing to serve if elected. For faculty and graduate students, the required number of members is five; for undergraduate students elected from a single faculty, the required number is twenty-five; for undergraduate students elected at large, the required number is one hundred.
Undergraduate student nominees, or their representatives, shall attend an all candidates’ mandatory meeting held by the Federation of Students. The chief returning officer, or designate, shall also be present. For faculty and graduate student elections, the chief returning officer shall publish the candidates’ statements in such places and ways as may be designated from time to time by Senate.

2.02 Campaigning/Voter Eligibility

Public campaigning shall not take place before the close of nominations. For faculty and graduate student elections, nominees are to provide a brief statement (100 words maximum) to appear with the ballot. The Federation of Students election rules regulating campaigning for undergraduate student elections, except for spending limits, shall be followed. The Federation of Students Election Committee decisions may be appealed to the USGC university secretary, who shall act as chief returning officer, and whose decision is final. The campaign spending limit for undergraduate students shall be: up to $100 for constituency seats and $200 for at-large seats, with all campaign costs to be borne by the candidate.

In a faculty constituency, all faculty members who hold a regular faculty appointment in that constituency are eligible to vote. In a graduate student constituency, all full-time and part-time graduate students registered in a degree program in that constituency are eligible to vote. In an undergraduate student constituency, all full-time students registered in a degree program in that constituency are eligible to vote; this includes students whose academic programs require a prolonged absence from campus such as a co-op work term or an approved study term abroad.

2.03 By-Elections

The USGC university secretary shall declare a Senate seat vacant:
upon receipt of a written resignation from a member of Senate.
when a member of Senate ceases to be eligible to represent the constituency that elected the member, for example when a faculty member ceases to hold a regular faculty appointment, or when a student graduates or otherwise ceases to be registered in the constituency that elected the student.

If, within any year, a member of the Senate or any of its committees or councils, not having been granted permission to be absent by such body, attends less than 50 per cent of the regular meetings of such body, the member’s office shall be by that very fact considered to be vacated and a confirmatory resolution shall be passed by Senate declaring the membership vacant. The Senate or its committee or council may grant such permission to members who are going on an approved sabbatical, on a co-op term, or any similar such absence related to the members’ employment and/or educational program.

Subject to the provisions noted below, the chief returning officer shall call by-elections to fill vacancies as soon as feasible and shall place a suitable notice in such places and ways as may be designated from time to time by Senate, with copies to the appropriate faculties and constituency presidents. Nominations shall remain open for at least one week and shall be submitted in writing to the chief returning officer. Each nomination shall be signed by the required number of members of the constituency from which the member is to be elected, and shall include a signed statement from the nominee agreeing to serve if elected. For faculty and graduate students, the required number of members is five; for undergraduate students elected from a single faculty, the required number is twenty-five; for undergraduate students elected at large, the required number is one hundred. When a seat is vacant because of the failure of a constituency to nominate any candidate to contest an election or by-election, that seat shall remain vacant until the next annual election, unless a petition [available from the Secretariat & Office of General Counsel] requesting a by-election
signed by the required number of members of the constituency concerned is received by the chief returning officer.
When a seat becomes vacant within three months of the end of the term for that seat, no by-election shall be called to fill the vacancy for the balance of the term.
No by-election shall be called or held in any constituency between 1 July and 15 September. In addition, no by-election shall be held in any undergraduate constituency between 1 April and 1 July.

3. Alumni representation

3.01 Each year the Alumni Council shall recommend the names of individual(s) for appointment to Senate. The USGC university secretary shall be informed of such recommendations as they are made and shall so inform Senate.

4. Board of Governors Representation

4.01 Each year the USGC university secretary shall request the Board of Governors to elect from among its community-at-large members as many as four individuals to serve as members of Senate pursuant to paragraph 18(b)(1) of The University of Waterloo Act, 1972. The USGC university secretary shall be informed of the results of such election promptly following its completion, and shall so inform Senate.

Approved by Senate 15 June 1972.
Amended by Senate April 1973.
Amended by Senate June 1975.
Amended by Senate in two readings, September and October 1975.
Amended by Senate in two readings, November and December 1982.
Amended by Senate in two readings, January and February 1983.
Amended by Senate in two readings, December 1984 and January 1985.
Amended by Senate in two readings, December 1989 and January 1990.
Amended by Senate in two readings, October and November 1990.
Amended by Senate in two readings, November and December 1991.
Amended by Senate September 1995.
Amended by Senate September 1999.
Amended by Senate in two readings, October and November 2013.
Amended from Bylaw 5 by Senate in two readings, September and October 2014.
Amended by Senate in two readings, January and February 2016.

1See The University of Waterloo Act, section 25, for instances when graduating students may be exempt.
Senate Graduate & Research Council met on 11 December 2017 and Senate Undergraduate Council met on 19 December 2017 and both councils considered a proposal for the academic calendar dates for 2018-19. Both councils agreed to forward the following item to Senate for approval as part of the regular agenda.

Further details are available at:
https://uwaterloo.ca/secretariat-general-counsel/committees-and-councils/senate-undergraduate-council
https://uwaterloo.ca/secretariat-general-counsel/committees-and-councils/senate-graduate-research-council

FOR APPROVAL

CALENDAR DATES

Office of the Registrar

1. **Motion:** To approve the 2018-19 calendar dates as presented in Attachment #1.

   **Rationale:** The dates lay out major academic milestones throughout the year and provide guidance to units throughout the campus community as they conduct academic planning within their respective areas.

//kw

Jeff Casello
Associate Vice-President, Graduate Studies and Postdoctoral Affairs

Charmaine Dean
Vice President, University Research

Mario Coniglio
Associate Vice-President, Academic
**Academic Calendar Dates, 2018-2019**

The following symbols and abbreviations are used throughout this table:

- (M) Monday, (T) Tuesday, (W) Wednesday, (R) Thursday, (F) Friday, (S) Saturday, (U) Sunday
- N/A – Not Applicable

<table>
<thead>
<tr>
<th></th>
<th><strong>Fall 2018</strong></th>
<th><strong>Winter 2019</strong></th>
<th><strong>Spring 2019</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-operative Work Term</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Begins *</td>
<td>Sept. 4 (T)</td>
<td>Jan. 7 (M)</td>
<td>May 6 (M)</td>
</tr>
<tr>
<td>Classes Begin</td>
<td>Sept. 6 (R)</td>
<td>Jan. 7 (M)</td>
<td>May 6 (M)</td>
</tr>
<tr>
<td>Holidays</td>
<td>Oct. 8 (M)</td>
<td>Feb. 18 (M)</td>
<td>May 20 (M)</td>
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<tr>
<td></td>
<td></td>
<td>Apr. 19 (F)</td>
<td>July 1 (M)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Aug. 5 (M)</td>
</tr>
<tr>
<td>Mid-Term Study Break</td>
<td>Oct. 9, 10 (T, W)</td>
<td>Feb. 19-22 (T-F)</td>
<td>N/A</td>
</tr>
<tr>
<td>Convocation</td>
<td>Oct. 19, 20 (F,S)</td>
<td>N/A</td>
<td>June 11-15 (T-S)</td>
</tr>
<tr>
<td>Classes End</td>
<td>Dec. 3 (M)</td>
<td>Apr. 5 (F)</td>
<td>July 30 (T)</td>
</tr>
<tr>
<td>Make-up Day(s) for in-term holidays and Mid-Term Study Break</td>
<td>Oct. 11 (R) <strong>Note:</strong> Tuesday schedule used to balance days; Oct. 12 (F) <strong>Note:</strong> Wednesday schedule used to balance days; Dec. 3 (M) for Thanksgiving</td>
<td>N/A</td>
<td>July 2 (T) <strong>Note:</strong> Monday schedule used to balance days; July 29 (M) for Victoria Day; July 30 (T) for July 2</td>
</tr>
<tr>
<td>Pre-Examination Study Days</td>
<td>Dec. 4, 5 (T,W)</td>
<td>Apr. 8-9 (M,T)</td>
<td>July 31-Aug. 1 (W,R)</td>
</tr>
<tr>
<td>On-Campus Examinations</td>
<td>Dec. 6 (R)</td>
<td>Apr. 10 (W)</td>
<td>Aug. 2 (F)</td>
</tr>
<tr>
<td>Begin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online Class Examination</td>
<td>Dec. 7, 8 (F,S)</td>
<td>Apr. 12, 13 (F,S)</td>
<td>Aug. 2 (F)</td>
</tr>
<tr>
<td>Days</td>
<td></td>
<td></td>
<td>Aug. 10 (S)</td>
</tr>
<tr>
<td>On-Campus Examinations</td>
<td>Dec. 21 (F)</td>
<td>Apr. 27 (S)</td>
<td>Aug. 16 (F)</td>
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<td>Dec. 21 (F)</td>
<td>Apr. 26 (F)</td>
<td>Aug. 23 (F)</td>
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<td>Ends *</td>
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<tr>
<td>Examination days</td>
<td>13+snow day</td>
<td>13+snow day</td>
<td>11</td>
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</tbody>
</table>
Guidelines for Determining Academic Calendar of Dates

The following are principles and guidelines either formally agreed upon by Senate or adopted as common practice in determining the dates for the academic year. Changes are highlighted.

1. That the practice of setting dates for each academic year continues to be an annual exercise.

2. That there be no fewer than 13 examination days in the Fall and Winter Terms, and 11 examination days in the Spring Term.

3. That there be no fewer than two pre-examination study days (excluding Saturday, Sunday, and holidays) between the end of classes and the beginning of examinations and the University will attempt to schedule more study days when possible (including Saturday, Sunday, and holidays). A clear rationale for using Saturday, Sunday, and holidays as pre-examination study days must be communicated to Senate at the time calendar dates are approved.

4. That there be no fewer than 60 teaching days in a term. A clear rationale for fewer than 60 teaching days must be communicated to Senate at the time calendar dates are approved.

5. That attention be given to balancing the number of meets in courses. Where an imbalance may occur because of holidays or the Mid-Term Study Break, courses may use the class schedule for a different day in order to balance the number of meets across all courses.

6. That Fall Term classes in September begin on the Thursday following the Labour Day holiday as per the requirements of the three-year Fall Break pilot starting in Fall 2016.

7. That in the Fall Term no examinations be scheduled beyond December 22.

8. That the start date for Winter Term be set as follows:
   - If January 1st is a Sunday, then start of classes is Wednesday, January 4th.
   - If January 1st is a Monday, then start of classes is Wednesday, January 3rd.
   - If January 1st is a Tuesday, then start of classes is Monday, January 7th.
   - If January 1st is a Wednesday, then start of classes is Monday, January 6th.
   - If January 1st is a Thursday, then start of classes is Monday, January 5th.
   - If January 1st is a Friday, then start of classes is Tuesday, January 5th.
   - If January 1st is a Saturday, then start of classes is Wednesday, January 5th.

9. That the 5-day Winter Reading Week occurs in all Faculties and must begin on the third Monday in February in keeping with an informal agreement with Wilfrid Laurier University and University of Guelph.

10. The start date for Spring Term is normally May 1, 2, or 3 when these dates fall on a Monday, Tuesday, or Wednesday. Otherwise the start date is the first Monday following May 3.

11. In calculating teaching days in a term, Saturdays, Sundays, and statutory or University holidays are excluded. An exception may be made to have a make-up class on Saturday in the Fall term when there is a late Labour Day.
12. In calculating examination days, Saturdays which fall within the period are included, whereas Sundays and statutory or University holidays are excluded. One exception to the above, approved by Undergraduate Operations Committee is that normally examinations will not be scheduled on the Saturday which follows Good Friday or the Saturday of the Civic Day weekend when that day falls within the examination schedule.

13. Grades due dates for on-campus courses are normally scheduled seven days from the date of the final examination. Grades for courses without a scheduled final examination are normally due 14 days after the start of examinations. Grades for Online (Centre for Extended Learning) courses are due on the last date of the grades submission period.

14. That Fall Convocation be the Friday and Saturday that fall in the third full week of October.

15. That Spring Convocation be the Tuesday to Saturday in the second full week in June.

16. That Online Class Examination Days in each term be the first Friday and Saturday after the exam period starts.

17. Co-op work terms are expected to be 16 week in duration. Actual start and end dates may vary depending on employer or student requirements in consultation with CECA.

18. That there be a two-day Fall Study Break following Thanksgiving Monday by starting classes on Thursday of Orientation week. This is a three-year pilot starting in Fall 2016.

Prepared by:
C. Newell Kelly, Registrar
December 11, 2017
Senate Graduate & Research Council met on 13 November 2017 as well as 11 December 2017 and considered a proposal to establish two new graduate diplomas. Council agreed to forward the following items to Senate for approval as part of the regular agenda.

Further details are available at: https://uwaterloo.ca/secretariat/committees-and-councils/senate-graduate-research-council

FOR APPROVAL

NEW PROGRAM

Faculty of Mathematics

1. **Motion:** To approve a new Type II Graduate Diploma in Quantum-Safe Cryptography, effective 1 January 2018, as presented in Attachment #1.

   **Rationale:** The Faculty of Mathematics is proposing a new diploma program in Quantum-Safe Cryptography offered in conjunction with existing master’s or doctoral degrees. Security in an era with quantum technologies is a growing concern for government and individuals around the world. Thus, it is imperative that new cryptography tools be designed, implemented, standardized, tested, and deployed before quantum computers are available to adversaries.

   The proposed Graduate Diploma in Quantum-Safe Cryptography (comprised of Specialized Technical Skills and Specialized Professional Skills training) will provide the education necessary to protect against the security challenges posed by quantum advances. Graduates of the diploma program will go on to serve the global community as Highly Qualified Personnel with specialized skills. The Graduate Diploma in Quantum-Safe Cryptography aims to:

   - Prepare a new generation of researchers to create quantum-safe tools for the 21st century
   - Provide professional knowledge and technical skills for all researchers
   - Foster collaboration between young scientists and experts in quantum and cryptographic research
   - Enable students to build relationships with cryptographic communities in academia, industry, and government
   - Encourage collaboration between students and partners in mathematics, computer science, physics and engineering
   - Allow students to study, discuss, and investigate challenges and applications for quantum-safe cryptography

Faculty of Environment

2. **Motion:** To approve a new Type III Graduate Diploma in Climate Risk Management, effective 1 September 2018, as presented in Attachment #2.

   **Rationale:** The proposed Graduate Diploma in Climate Risk Management (GDip CRM) is designed to meet the needs of early to mid-career professionals who have been tasked with climate change risk management as part of their regular professional duties. The proposed graduate diploma is aligned with both the University and Faculty Strategic Plans by providing applied curriculum and skills that are of relevance to multiple disciplines and professions. It will be delivered fully on-line to facilitate upskilling of employed professionals with an undergraduate degree who need some additional applied competence in climate risk management and who are not in a position to take a full year leave for a more
comprehensive on campus degree program, such as the University of Waterloo’s existing Master of Climate Change (MCC degree).

The program will be housed in the Department of Geography and Environmental Management, which already hosts Canada’s only Master of Climate Change degree, and includes contributions from the School of Planning and external experts where additional industry professionals are needed to meet graduate degree level expectations in rapidly developing areas of professional practice. The courses to be developed as part of the Diploma will use the existing Master of Climate Change course codes (GEMCC); however, some individual courses developed for the GDip CRM will be cross-listed with the School of Planning, the Department of Geography and Environmental Management, and the School of Environment, Enterprise and Development.

Graduates of the Graduate Diploma in Climate Risk Management (GDip CRM) will possess competence in the science of climate change and associated mitigation and adaptation challenges as well as response strategies at the global and Canadian scales, and gain in-depth expertise in applied climate risk management.

//kw  Jeff Casello
      Associate Vice-President, Graduate Studies and Postdoctoral Affairs

                          Charmaine Dean
                          Vice President, University Research
University of Waterloo
Graduate Expedited Proposal
of the
Graduate Diploma in Quantum-Safe Cryptography
Volume I-Proposed Brief
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I. Brief Description and Rationale

Information security is at the core of information and communication technologies (ICT). Organizations around the world go to great lengths to ensure important information is secure and reliable. As new technologies emerge — such as quantum information processing, which poses novel threats to information security — so too does the need to develop innovative strategies to guarantee data security.

Quantum computers will break some of the foundational pieces of our current cybersecurity infrastructure. It is imperative that new cryptography tools designed to be safe in an era with quantum computers be designed, implemented, standardized, tested, and deployed before quantum computers are available to adversaries.

It is therefore critical to develop these cutting-edge tools and train the next generation of Highly Qualified Personnel (HQP) in the field.

The 5-year-old CryptoWorks21 program (NSERC CREATE Training Program in Building a Workforce for the Cryptographic Infrastructure of the 21st Century) have been preparing this new generation of HQP to pioneer a new global infrastructure for quantum-safe cryptography. It is hosted by the University of Waterloo’s Centre for Applied Cryptographic Research (CACR) and the Institute for Quantum Computing (IQC). Since the program inception in 2012, the Program Director, Professor Mosca alongside industry and academic partners and collaborators have developed and delivered two important training programs: a Specialized Technical Skills and a Specialized Professional Skills program. These complementary programs have been preparing students in the CryptoWorks21(CW21) program ready to tackle forthcoming cryptographic challenges. The training programs have brought together researchers, organizations and industry members from a wide range of areas and expertise to ensure Canada’s HQP lead the current market for emerging technology research and development.
II. Objectives of the Program

Security in an era with quantum technologies is a growing concern for government and individuals around the world. The Institute for Quantum Computing at the University of Waterloo provides world renowned education in quantum computing. The proposed Graduate Diploma in Quantum-Safe Cryptography will provide the education necessary to protect against the security challenges posed by quantum advances. Graduates of the diploma program will go on to serve the global community as Highly Qualified Personnel with specialized skills. The Graduate Diploma in Quantum-Safe Cryptography aims to:

- Prepare a new generation of researchers to create quantum-safe tools for the 21st century
- Provide professional knowledge and technical skills for all researchers
- Foster collaboration between young scientists and experts in quantum and cryptographic research
- Enable students to build relationships with cryptographic communities in academia, industry, and government
- Encourage collaboration between students and partners in mathematics, computer science, physics and engineering
- Allow students to study, discuss, and investigate challenges and applications for quantum-safe cryptography

An illustration of the program's Learning Objectives as aligned with the Graduate Degree Learning Expectations can be found in Appendix A (Table XI-a).

III. Admissions Requirements

As a type 2 diploma program there would be no formal admissions procedure into the proposed program, once a student is admitted to a University of Waterloo graduate program they would be eligible to enroll in the Graduate Diploma in Quantum-Safe Cryptography. It is most likely that students who choose to pursue the Quantum-Safe Cryptography Diploma will register in one of the following programs:

MMath Computer Science
MMath Computer Science (QI)
PhD Computer Science
PhD Computer Science (QI)
MMath Combinatorics & Optimization
MMath Combinatorics & Optimization (QI)
PhD Combinatorics & Optimization
PhD Combinatorics & Optimization (QI)
MMath Pure Math
PhD Pure Math
MASc Electrical and Computer Engineering (including Nanotechnology)
MASc Electrical and Computer Engineering (QI)
PhD Electrical and Computer Engineering (including Nanotechnology)
PhD Electrical and Computer Engineering (QI)
MSc Physics (including Nanotechnology)
MSc Physics (QI)
PhD Physics (including Nanotechnology)
PhD Physics (QI)

Students in the above listed programs would indicate their intention to complete the Graduate Diploma by completing the QSC (Quantum-Safe Cryptography) Diploma Enrollment Form developed by CryptoWorks 21. The form will be posted on the CW21 website, available through the CW21 staff and linked from the Graduate Studies Academic Calendar. Students may complete the form at any time throughout their degree, however it is our hope that students interested in completing the diploma would complete the form early on in their graduate career. Once the QSC Diploma Enrollment form is received by the CW21 staff they could then track the students’ progress using QUEST and an internal tracking processes.

UW graduate students indicate on the Graduate Studies Intention to Graduate/Program Completion form that they have completed the Graduate Diploma in Quantum Safe Cryptography. If a student identifies the Graduate Diploma in Quantum Safe Cryptography on their intention to graduate from the GSO would then communicate the students name to CW21 staff at which time the CW21 staff would check that the student has completed all necessary components of the diploma.
IV. Degree Requirements

The Quantum-Safe Cryptography Diploma would require the completion of 4 (0.5) graduate level courses and three milestones. The requirements are divided into 2 areas of expertise; Technical and Professional, with a final milestone to incorporate the technical and professional knowledge.

The overall program requirements will be as follows;

Technical

2 (0.5) Courses in Quantum Safe Cryptography selected from list of approved courses

1 Milestone in Technical Skills - completion of short modules or course alternatives in each of the skill areas

BE 606 (0.5)

BE600 (0.5)

Professional

1 Milestone in Professional skills

1 Milestone in Integration of Professional and Technical skills

Please see below for more detailed information of the specific areas of expertise:

a. Technical Courses and Milestones

Students must gain knowledge in the following technical skills areas:

- Network security.
- (Conventional) Cryptography.
- Post-quantum cryptography.
- Quantum cryptography theory.
- Implementation of quantum communication.
- Quantum computation.

The default method for achieving the technical skills milestone will be to complete the respective 6 in-class modules. A module will consist of 6 hours of lecture and an assignment. A student can forgo any one of the 6 modules in favor of a listed course alternative in the corresponding skill area. Any graduate courses completed in this way can be used towards the course requirements for the Diploma.
The alternative courses for each technical skill area will be listed in the Graduate Studies Academic Calendar and can been seen in Table IV-a.

*Table IV-a: Course Alternatives*

<table>
<thead>
<tr>
<th>Technical Skill Area</th>
<th>Short Module</th>
<th>Course Alternative <em>(Other courses as approved by the CryptoWorks21 Technical Skills Committee)</em></th>
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</thead>
<tbody>
<tr>
<td>Network Security</td>
<td>CW21 Network Security module</td>
<td>CS 658, ECE 628</td>
</tr>
<tr>
<td>Cryptography</td>
<td>CW21 Cryptography module</td>
<td>CO 685, CO 687</td>
</tr>
<tr>
<td>Post-Quantum Cryptography</td>
<td>CW21 Post-Quantum Cryptography module</td>
<td>Currently no alternative</td>
</tr>
<tr>
<td>Quantum Cryptography Theory</td>
<td>CW21 Quantum Cryptography Theory module</td>
<td>QIC 890 (topic 2) Applied Quantum Cryptography</td>
</tr>
<tr>
<td>Implementation of Quantum Communication</td>
<td>CW21 Implementation of Quantum Communication module</td>
<td>QIC 890 (topic 3) Implementation of Quantum Communication</td>
</tr>
<tr>
<td>Quantum Computation</td>
<td>CW21 Quantum Computation module</td>
<td>QIC 710/AM 871/ CO 681/CS 768/PHYS 767</td>
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<tr>
<td></td>
<td></td>
<td>CO 481, CS 467, PHYS 467 (acceptable alternatives to milestones however Undergraduate courses cannot be counted towards the Diploma course requirements)</td>
</tr>
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</table>

In addition to the technical skills area milestone requirements students must also complete the equivalent of 1.0 graduate level credits (commonly 2 graduate courses) from the list (to be included in the Graduate Studies Academic Calendar) below.

**Quantum-Safe Cryptography Courses** *(choose the equivalent of 1.0 graduate credits from the list below)*
CS 658 (0.5) Computer Security and Privacy
ECE 628 (0.5) Computer Network Security
CO 685 (0.5) The Mathematics of Public-Key Cryptography
CO 687 (0.5) Applied Cryptography
QIC 890 (0.5) Applied Quantum Cryptography (topic 2)
QIC 890 (0.5) Implementation of Quantum Communication (topic 3)
QIC 710/CS 768/AMATH 871/CO 681/PHYS 767 (0.5) Quantum Information Processing
QIC 890 (0.5) Topics in quantum-safe cryptography (topic 19)
Other courses as approved by the CryptoWorks21 Technical Skills Committee

For example, a student could choose to complete CS 658 & QIC 710 satisfying the Technical skill areas of Network Security and Quantum Computation. The student must then participate in the short modules for Cryptography, Post-Quantum Cryptography, Quantum Cryptography Theory and Implementation of Quantum Communication to fulfill the Technical Skills milestone. This method would also use CS 658 and QIC 710 to satisfy the two (0.5) course requirement in the technical portion of the diploma).

These areas represent the breadth of knowledge required to be able to understand and articulate the options for preparing a specific ICT system to be secure in the context of quantum computers. However, technical knowledge is not enough to evolve our ICT infrastructure to be safe in an era with quantum computers. To complement the technical knowledge, we have implemented a training track with 5 professional areas of knowledge.

a. Professional Courses and Milestones

The professional training for those participating in the diploma program will be gained through the completion of the two required courses, BE 600 and BE 606 and satisfaction of two additional milestones.

BE 600 and BE 606 will cover the following topics:

- IP Protection and Management
- Entrepreneurship and Commercialization
- Communication
Management

1 milestone in Standards and Certification will cover the fifth professional skill by the same name. It will be taught by experts in the fields that relate to this particular skill development. In the past, we have experts from National Institute of Standards and Technology, European Telecommunications Standards Institute, Microsoft, United Knowledge and UW. It will be taught over the course of two days with a culminating assignment. The workshop consists of overviewing of the standards, case studies, aligning standards to business models, certification and standards and certification for post-quantum cryptography etc.

The final milestone of the program will bring together the knowledge of technical and professional skills in the Integration of Professional and Technical skills milestone. This milestone will be offered as a two-day seminar with a culminating assignment and will inform students how to apply core concepts in entrepreneurship to a new venture or academic research. Students will use the Lean Launchpad approach to identify and validate problems and to arrive at executable research or a commercial solution.

How each of the courses and milestones will contribute to the program's overall learning outcomes is articulated in Appendix A (Table XI-b & Table XI-c).

Graduate Studies Program Revision Template is located in Appendix B
New milestone forms are located in Appendix C.

V. Program Structure

Students may join the Graduate Diploma on an ongoing basis, without an additional admission process there will be no need for a formal intake period. To earn the Graduate Diploma in Quantum-Safe Cryptography students must complete the equivalent of 4 (0.5) graduate level courses and three milestones. The program must be completed while the student is registered in their primary degree, students would be subject to the University standard timelines for
Masters and Doctoral programs completion. Masters and PhD students would have ample time satisfy the requirements during the course of their studies and are not expected to extend the timelines for their degree completion.

Students may choose to study on a full time or part-time basis to earn their diploma. This will occasionally be dictated by course offering and demands of the student's primary degree requirements.

The diploma program is structured in such a way that a student would be able to count courses completed as part of their graduate degree towards the requirements for the diploma program. Depending on the student's home faculty and graduate degree being sought there will be a different number of courses required above and beyond their degree requirements. Below is a table of the potential number of additional courses required for diploma completion. The information below is based on the current program requirements.

For example, a student in the diploma program could take CS 658 and CS 768. Based on the calendar entry for MMath in Computer Science (link below) the student would satisfy two CS courses from the table of CS approved courses (CS 658 and CS 768). The student would still have to fulfill the CS 800 level course requirement and 1 other from the CS approved list (above the 600 level) along with the milestone and BE 600 and BE 606 requirements for the diploma.
Table V-a: Potential Additional Course (double click to access excel workbook)

<table>
<thead>
<tr>
<th>Program</th>
<th>Number of Courses required for Degree</th>
<th>Potential number of courses that could be used towards Diploma (maximum 2)</th>
<th>Additional courses required for Degree</th>
<th>Additional courses required for Diploma (minimum 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Science</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MMath Computer Science</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>MMath Computer Science (QI)</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>PhD Computer Science (entry from Masters)</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>PhD Computer Science (QI) (entry from QI Masters)</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Combinatorics and Optimization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MMath Combinatorics &amp; Optimization</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>MMath Combinatorics &amp; Optimization (QI)</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>PhD Combinatorics &amp; Optimization</td>
<td>8</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>PhD Combinatorics &amp; Optimization (QI)</td>
<td>8</td>
<td>2</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Pure Math</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MMath Pure Math</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>PhD Pure Math</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Electrical and Computer Engineering</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MASc Electrical and Computer Engineering</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>MASc Electrical and Computer Engineering</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>MASc Electrical and Computer Engineering (QI)</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>PhD Electrical and Computer Engineering (entry from Masters)</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>PhD Electrical and Computer Engineering (Nanotechnology) (entry from Masters)</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>PhD Electrical and Computer Engineering (QI) (entry from a)</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Physics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSc Physics</td>
<td>4</td>
<td>1+</td>
<td>&lt;3</td>
<td>~2</td>
</tr>
<tr>
<td>MSc Physics (Nanotechnology)</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>MSc Physics (QI)</td>
<td>4</td>
<td>1+</td>
<td>&lt;3</td>
<td>~2</td>
</tr>
<tr>
<td>PhD Physics (entry from Masters)</td>
<td>4</td>
<td>1+</td>
<td>&lt;3</td>
<td>~2</td>
</tr>
<tr>
<td>PhD Physics (Nanotechnology) (entry from non-NANO Masters)</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>PhD Physics (QI) (entry from QI Masters)</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>
The Offering schedule for the Quantum-Safe Cryptography courses delivered at UW is below.

Table V-b: Course Offering Schedule

<table>
<thead>
<tr>
<th>Course</th>
<th>2017-18</th>
<th>2018-19</th>
<th>2019-20</th>
<th>2020-21</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>W</td>
<td>S</td>
<td>F</td>
</tr>
<tr>
<td>QIC 710/AM 871/CO 681/CS 768/PC 767</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>QIC 890 (topic 3)</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>QIC 890 (topic 19)</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS 658</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>ECE 628</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>CO 685</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>CO 687</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>CO 481/CS 467/PHY 467</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

VI. Course Descriptions

QIC 710 Quantum Information Processing (0.50) LEC

(Cross-listed with AMATH 871, CO 681, CS 768, PHYS 767)

Review of basics of quantum information and computational complexity; Simple quantum algorithms; Quantum Fourier transform and Shor factoring algorithm: Amplitude amplification, Grover search algorithm and its optimality; Completely positive trace-preserving maps and Kraus representation; Non-locality and communication complexity; Physical realizations of quantum computation: requirements and examples; Quantum error-correction, including CSS codes, and elements of fault-tolerant computation; Quantum cryptography; Security proofs of quantum key distribution protocols; Quantum proof systems. Familiarity with theoretical computer science or quantum mechanics will also be an asset, though most students will not be familiar with both.
QIC 890 Topics in Quantum Information (0.50) LEC

2 Applied Qtm Cryptography
3 Impltn of Qtm Communication
19 Topics in Quantum-Safe Crypto

CS 467 LEC, TST 0.50 Introduction to Quantum Information Processing
Basics of computational complexity; basics of quantum information; quantum phenomena; quantum circuits and universality; relationship between quantum and classical complexity classes; simple quantum algorithms; quantum Fourier transform; Shor factoring algorithm; Grover search algorithm; physical realization of quantum computation; error-correction and fault-tolerance; quantum key distribution. [Offered: W]

CS 658 Computer Security and Privacy (0.50) LAB, LEC
Security and privacy issues in various aspects of computing. Specific topics include: comparing security and privacy, program security, writing secure programs, controls against program threats, operating system security, formal security models, network security, Internet application security and privacy, privacy-enhancing technologies, database security and privacy, inference data mining, security policies, physical security, economics of security, and legal and ethical issues. (Note: Knowledge of operating systems equivalent to that obtained from CS 350 is assumed.)

CO 481 LEC, TST 0.50 Introduction to Quantum Information Processing
Basics of computational complexity; basics of quantum information; quantum phenomena; quantum circuits and universality; relationship between quantum and classical complexity classes; simple quantum algorithms; quantum Fourier transform; Shor factoring algorithm; Grover search algorithm; physical realization of quantum computation; error-correction and fault-tolerance; quantum key distribution. [Offered: W]

CO 685 The Mathematics of Public-Key Cryptography (0.50) LEC
An in-depth study of public-key cryptography, including: number-theoretic problems - prime generation, integer factorization, discrete logarithms; public-key encryption; digital signatures; key establishment; secret sharing; and security definitions and proofs.

**CO 687 Applied Cryptography (0.50) LEC**

A broad introduction to cryptography, highlighting the major developments of the past twenty years, including symmetric ciphers, hash functions and data integrity, public-key encryption and digital signatures, key establishment, and key management. Applications to internet security, computer security, communications security, and electronic commerce will be studied.

**ECE 628 Computer Network Security (0.50) LEC**


**PHYS 467 LEC, TST 0.50 Introduction to Quantum Information Processing**

Basics of computational complexity; basics of quantum information; quantum phenomena; quantum circuits and universality; relationship between quantum and classical complexity classes; simple quantum algorithms; quantum Fourier transform; Shor factoring algorithm; Grover search algorithm; physical realization of quantum computation; error-correction and fault-tolerance; quantum key distribution. [Offered: W]

**BE 600 Management and Leadership (0.50)**

This course provides students with the opportunity to develop a range of soft skills and the business acumen necessary to maximize the likelihood of business success. Topics include communication and interpersonal skills, leadership, and negotiation skills. A range of applied
approaches are used, including integrated cases, simulations, and interaction with the local business community. MEng and GDip students only.

**BE 606 Entrepreneurship and innovation (0.50)**

This course introduces students to the theory underlying entrepreneurship, venture creation and innovation management, as well as its practical implications. Topics covered include introduction to entrepreneurship and innovation, the dynamics of innovation, corporate entrepreneurship and commercialization, venture creation and the management of high-performance innovative teams.

**VII. Mode of Delivery**

All instruction in the Quantum-Safe Cryptography program will be given face-to-face. The courses will be delivered in either the traditional weekly format or as intensive block courses. Block courses will be offered in the Spring terms, lasting between 1 and 2 weeks. The courses will have a credit weight of 0.5 and therefore require a total of 36 hours of lectures. It is reasonable to expect the lectures to be delivered over the course of 4-5 full days. This block course format may prove challenging for some students as it could affect their other registration during the spring term, however Table 3 indicates that there are significantly less course offerings in the Spring terms. Similarly, the intensive instruction model is growing in popularity at several Canadian Universities and the CryptoWorks21 has already implemented the equivalent of a 0.5 credit professional skills course in past spring terms in a 1-week period.

**VIII. Assessment of Teaching and Learning**

a. **Teaching Assessment**

To ensure the students are receiving the highest quality instruction and course content, the course registrants will be polled electronically with a number of specific and open ended questions. The responses will be collated and analyzed to inform future course content and instruction. As enrollment in the proposed Graduate Diploma in Quantum-Safe Cryptography increases there may be some merit in employing more formalized course evaluations, however
the current practice used by the CryptoWorks21 program could be used until such a change becomes necessary.

b. Learning Assessment

Each of the required courses will employ a number of different evaluation tools. Students will be expected to demonstrate the knowledge they have gained through completion of quizzes, written assignments, possible short research papers, and mock course proposals. Some of the technical courses will contain a final examination; the evaluation tools will be chosen at the discretion of the instructor.

The diploma program will include new graduate diploma seminar milestones to provide students the necessary training in Quantum-Safe Cryptography. The milestones will be evaluated by diploma faculty members and recorded as complete on the student's transcript.

IX. Resources

Institutional Analysis & Planning (IAP) has reviewed the proposed Type 2 Graduate Diploma in Quantum-Safe Cryptography and based on the revenue and expenditure inputs provided by IQC, this program doesn’t presently pose any significant financial challenges.

The program understands that this diploma will not generate additional tuition or grant revenues and has attested that the resources required to run the diploma are already in place and will not put additional strain on the current funding model. There is no additional space, equipment, TA or technical staff required or requested for this diploma program. CW21 has an agreement in place with CBET to compensate them for their costs to support additional sections of BE600 and BE606 through internal charge out. The CryptoWorks21 program currently has the resources to provide any additional funding necessary for the first year of the program. Should CW21 not be in a position to continue self-funding this program once this period expires, they will contact IAP, and a new financial viability analysis and agreement will be negotiated.
X. Quality and Other Indicators

The city of Waterloo has attracted high caliber professionals in the field of cryptography in quantum context for several years. The Faculty involved with the proposed Quantum Safe Cryptography Graduate Diploma are highly visible leaders in the global community (as illustrated by their Curriculum Vitae in Appendix D). The caliber of the Faculty designing and instructing the program speaks to the overall quality of the program. The Faculty and Instructors represent a wide range of academic expertise that combine to cover the breadth of skills being taught in the program. As well as the current primary Faculty members, the program will call on guest speakers to give lectures and allow the students to receive the most relevant and up-to-date instruction available in the field.

XI. Projected Enrollment

Since its inception in 2012 the existing CryptoWorks 21 program has grown in population from 23 to 64 students. Applications to the current program are further evidence of the increased interest and need for a formalized program in Quantum Safe Cryptography. In its first year of existence the CW21 program received a total of 37 applications (from graduate students and postdoctoral fellows) since October 2013 CW21 has received an additional 229 applications (from graduate and postdoctoral fellows) with 161 of those applications received in the past 2 years. These numbers are a clear indication of the demand for programming specializing in Quantum-Safe Cryptography. It is our expectation that with a specific credential attached to the specialized training the program will attract a small class, about 15 students, in year one of the program. Based on the existing CW21 program enrolment, we anticipate a 50/50 split between domestic and International students.

Considering the growth rate of the CW21 program we anticipate enrollment to grow steadily with each academic cycle. Admission to the Graduate Diploma in Quantum Safe Cryptography would be granted to any student already admitted to a University of Waterloo graduate program. It is most likely that students who choose to pursue the Quantum-Safe Cryptography Diploma will be registered in the programs we listed in the admissions section.
Demand for experts in Information Protection increases each day with the growing cases of compromised security. As demand grows we will be offering a credential not widely available in the academic community. Market demand should ensure strong initial enrollment from current University of Waterloo students and have the potential attract students to enroll at the University to have access to this unique diploma program.
Appendix A

Program Outcomes
Courses to Outcomes
Courses to Expectations
### Table XI-a: Program Outcomes

<table>
<thead>
<tr>
<th>PROGRAM OUTCOMES</th>
<th>1. Depth and Breadth of Knowledge</th>
<th>2. Research and Scholarship</th>
<th>3. Level of Application of Knowledge</th>
<th>4. Professional Capacity/Autonomy</th>
<th>5. Level of Communications Skills</th>
<th>6. Awareness of Limits of Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>To understand how cryptography is used to protect our cyber systems</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To understand the impact quantum technologies will have on current cyber infrastructure</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To understand both the quantum and classical solutions to the quantum threat, and their respective strengths and weaknesses</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To understand the current state of implementation of quantum computing and of quantum-safe cryptography</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To understand the challenges of turning new technology into commercializable products and services</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To understand the challenges of bringing new cryptographic methods to wide-scale deployment</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To be able to communicate the problem and opportunity posted by emerging quantum technologies to a range of relevant stakeholders</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To understand standards and certification and their role in wide-scale deployment of new cryptographic technology</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table XI-b: Courses to Outcomes

<table>
<thead>
<tr>
<th>Courses and Key Learning Experiences</th>
<th>Core Courses</th>
<th>Milestones</th>
<th>Elective Courses (2 of the following required)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BE606</td>
<td>BE600</td>
<td>Technical Skills</td>
</tr>
<tr>
<td>To understand how cryptography is used to protect our cyber systems</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To understand the impact quantum technologies will have on current cyber infrastructure</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To understand both the quantum and classical solutions to the quantum threat, and their respective strengths and weaknesses</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To understand the current state of implementation of quantum computing and of quantum-safe cryptography</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To understand the challenges of turning</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>

To understand how cryptography is used to protect our cyber systems:

- To understand the impact quantum technologies will have on current cyber infrastructure:
- To understand both the quantum and classical solutions to the quantum threat, and their respective strengths and weaknesses:
- To understand the current state of implementation of quantum computing and of quantum-safe cryptography:
- To understand the challenges of turning
| Description                                                                 | | | | | | |
|-----------------------------------------------------------------------------|---|---|---|---|---|
| new technology into commercializable products and services                  |   |   |   |   |   |
| To understand the challenges of bringing new cryptographic methods to wide-scale deployment | x | x | x | x | x |
| To be able to communicate the problem and opportunity posted by emerging quantum technologies to a range of relevant stakeholders | x | x |   | x |   |
| To understand standards and certification and their role in wide-scale deployment of new cryptographic technology | x |   | x | x |   |
Table XI-c: Courses to Expectations

<table>
<thead>
<tr>
<th>Core Courses</th>
<th>Milestones</th>
<th>Elective Courses (2 of the following required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BE606</td>
<td>BE600</td>
<td>Technical Skills</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Standards &amp; Certification</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Integration of Technical and Professional Skills</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CS658/E</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CO685/CO687</td>
</tr>
<tr>
<td></td>
<td></td>
<td>QIC890 (topic 2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>QIC890 (topic 3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Q/C891 (topic 5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>QIC710/CO481/CS467/PHYS467 (Quantum Computation)</td>
</tr>
</tbody>
</table>

1. Depth and Breadth of Knowledge

A systematic understanding of knowledge and a critical awareness of current problems and/or new insights, much of which is at, or informed by, the forefront of their academic discipline, field of study, or area of professional practice; x x x x x x x x x

2. Research and Scholarship

A conceptual understanding and methodological competence that:

i) Enables a working comprehension of how established techniques of research and inquiry are used to create and interpret knowledge in the discipline; x x x x x x x x
ii) Enables a critical evaluation of current research and advanced research and scholarship in the discipline or area of professional competence; x x x x x x x

iii) Enables a treatment of complex issues and judgments based on established principles and techniques; and, x x x x x x x x

On the basis of that competence, has shown at least one of the following:

i) The development and support of a sustained argument in written form; or x x

ii) Originality in the application of knowledge. x x

3. Level of Application of Knowledge

Competence in the research process by applying an existing body of knowledge into the critical analysis of a new question or of a specific problem or issue in a new setting. x x x x

4. Professional Capacity/Autonomy

a. The qualities and transferable skills necessary for employment requiring:

i) The exercise of initiative and of personal responsibility and accountability; x
### 2. Professional Competence

- **ii) Decision-making in complex situations;**
  - X
  - X
  - X

- **b. The intellectual independence required for continuing professional development;**
  - X

- **c. The ethical behavior consistent with academic integrity and the use of appropriate guidelines and procedures for responsible conduct of research; and**
  - X
  - X

- **d. The ability to appreciate the broader implications of applying knowledge to particular contexts.**
  - X
  - X
  - X

#### 5. Level of Communications Skills

- The ability to communicate ideas, issues and conclusions clearly.
  - X
  - X
  - X

#### 6. Awareness of Limits of Knowledge

- Cognizance of the complexity of knowledge and of the potential contributions of other interpretations, methods, and disciplines.
  - X
  - X
  - X
  - X
  - X
  - X
  - X
  - X
  - X
  - X
Appendix B

Graduate Studies Program Revision Template
Prior to form submission, review the content revision instructions and information regarding major/minor modifications. For questions about the form submission, contact Trevor Clews, Graduate Studies Office.

**Faculty**: Mathematics  
**Program**: Graduate Diploma (GDip) in Quantum-Safe Cryptography  
**Program contact name(s)**: Michele Mosca  
**Form completed by**: Jessica Parris

**a. Description of proposed changes:**

Note: changes to courses and milestones also require the completion/submission of the SGRC Course/Milestone-New/Revision/Inactivation form (PC docx version or MAC docx version).

See attached program proposal, including the SGRC Course/Milestone-New/Revision/Inactivation forms.

**Is this a major modification to the program?** Yes  
**Rationale for change(s):**

See attached program proposal.

**Proposed effective date**: Term: Winter   Year: 2018

Current Graduate Studies Academic Calendar (GSAC) page (include the link to the web page where the changes are to be made):

No current GSAC content (new program). Content will be located in the Department of Combinatorics and Optimization section of the GSAC:

https://uwaterloo.ca/graduate-studies-academic-calendar/mathematics/department-combinatorics-and-optimization
Graduate Diploma (GDip) in Quantum-Safe Cryptography

Program information

- Delivery mode
  - On-campus
- Program type
  - Diploma
- Study option(s)
  - Coursework

Admission requirements

- Minimum requirements
  - The Graduate Diploma (GDip) in Quantum-Safe Cryptography is offered in conjunction with existing master's or doctoral degrees. To be eligible for the GDip in Quantum-Safe Cryptography, students have to be enrolled in a master's or doctoral program in a department that already offers an approved graduate degree.
  - Students from any faculty may indicate their intent to enroll in the GDip in Quantum-Safe Cryptography by completing the QSC (Quantum-Safe Cryptography) Diploma Enrollment Form, available on the Cryptoworks 21 website.

b. Degree requirements

  Coursework option:

  - Courses
    - To receive the GDip in Quantum-Safe Cryptography, students must successfully complete 4 one-term (0.50) graduate level courses, 2 required courses and 2 elective courses:
      - Required courses:
        - BE 600 Management and Leadership
        - BE 606 Entrepreneurship and Innovation
      - Elective courses (choose 2 from the following list):
        - CO 685 The Mathematics of Public-Key Cryptography
        - CO 687 Applied Cryptography
        - CS 658 Computer Security and Privacy
        - ECE 628 Computer Network Security
        - QIC 710/AMATH 871/CO 681/CS 768/PHYS 767 Quantum Information Processing
        - QIC 890 Topic 2 Topics in Quantum Information: Applied Quantum Cryptography
        - QIC 890 Topic 3 Topics in Quantum Information: Implementation of Quantum Communication
Proposed Graduate Studies Academic Calendar content:

- QIC 890 Topic 19 Topics in Quantum Information: Topics in Quantum-Safe Cryptography
- Other courses as approved by the CryptoWorks 21 Technical Skills Committee.

- **Link(s) to courses**
  - Combinatorics and Optimization (CO) courses
  - Graduate course search

- **Diploma Seminar 1 – Technical Skills**

  Students must complete 6 in-class modules (or the listed course alternative), a module will consist of 6 hours of lecture and an assignment. Students can forgo any one of the 6 modules in favor of a listed course alternative in the corresponding skill area. Any graduate courses completed in this way can be used towards the course requirements for the GDip.

<table>
<thead>
<tr>
<th><strong>TECHNICAL SKILL AREA</strong></th>
<th><strong>SHORT MODULE</strong></th>
<th><strong>COURSE ALTERNATIVE (other courses as approved by the CryptoWorks21 Technical Skills Committee)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Security</td>
<td>CW21 Network Security module</td>
<td>CS 658, ECE 628</td>
</tr>
<tr>
<td>Cryptography</td>
<td>CW21 Cryptography module</td>
<td>CO 685, CO 687</td>
</tr>
<tr>
<td>Post-Quantum Cryptography</td>
<td>CW21 Post-Quantum Cryptography module</td>
<td>Currently no alternative</td>
</tr>
<tr>
<td>Quantum Cryptography Theory</td>
<td>CW21 Quantum Cryptography Theory module</td>
<td>QIC 890 Topic 2 Applied Quantum Cryptography</td>
</tr>
<tr>
<td>Implementation of Quantum Communication</td>
<td>CW21 Implementation of Quantum Communication module</td>
<td>QIC 890 Topic 3 Implementation of Quantum Communication</td>
</tr>
<tr>
<td>Quantum Computation</td>
<td>CW21 Quantum Computation module</td>
<td>QIC 710/AMATH 871/CO 681/CS 768/PHYS 767</td>
</tr>
</tbody>
</table>
<pre><code>                                |                                 | CO 481, CS 467, PHYS 467                                                                         |
</code></pre>
<table>
<thead>
<tr>
<th>Current Graduate Studies Academic Calendar content:</th>
<th>Proposed Graduate Studies Academic Calendar content:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(acceptable alternatives for milestones, however, Undergraduate courses cannot be counted towards the GDip course requirements)</td>
<td></td>
</tr>
</tbody>
</table>

- **Diploma Seminar 2 – Standards and Certification**

Completion of a 2-day workshop with culminating assignment.

This milestone will focus on the importance of standards and certification when introducing new technologies to the marketplace and the avenues for standardization and certification of quantum-safe cryptographic technologies.

Students will develop an understanding of several components of these topics including:

- Standards
- Relevance
- Importance for deployability
- Competitiveness
- Large-scale adoption
- Compliance organizations and development

- **Diploma Seminar 3 – Integration of Professional and Technical Skills**

Completion of a 2-day workshop with culminating assignment.

This seminar will inform students how to apply core concepts in entrepreneurship to a new venture or academic research. Students will use the Lean Launchpad approach to identify and validate problems and to arrive at executable research or a commercial solution. The intended learning outcomes for the milestone are:

- Define the lean canvas and explain its purpose.
- Distinguish and summarize the difference between the product and market, understand their fit and articulate the definition of: key metrics, unique value proposition, unfair advantage, channels, customer segments, cost structure and revenue streams.
- Construct customer profiles; engage in customer development and product market validation for an academic project or new venture.
- Develop an applicable intellectual property strategy to their product and idea.
- Assemble a pitch and be able to effectively present and articulate their business idea or research project clearly.
- Provide alternative views to expand and support their research and testing.

How will students currently registered in the program be impacted by these changes?
Section will expand to accommodate content. Please include details here.

Departmental approval date (mm/dd/yy):
Reviewed by GSO (for GSO use only) □ date (mm/dd/yy):
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if applicable):
Appendix C

New Milestones

Integration of Technical and Professional Skills
Standards and Certification
Technical Skills
Faculty: Math
Effective term: Term/Year Spring 2017

Course ☐ New ☐ Revision ☐ Inactivation ☐

Milestone ☒ New ☒ Revision ☐ Inactivation ☐

New milestone title: Graduate Diploma Seminar

For course revisions, indicate the type(s) of changes:
(e.g. consent, description, title, requisites)
Course Subject code: Choose an item. Course number:
Course Title (max. 100 characters incl. spaces):
Course Short Title (max. 30 characters incl. spaces):
Grading Basis: Choose an item.
Course Credit Weight: Choose an item.
Course Consent Required: ☐ Choose an item.

Course Description:
New course description (for revision only):

Meet Type(s): Choose an item. Choose an item. Choose an item. Choose an item.
Primary Meet Type: Choose an item.

Requisites:
Special topics course: Yes ☐ No ☐
Cross-listed: Yes ☐ No ☐

Course Subject(s) to be cross-listed with and approval status:
Sections combined/heldwith:

Rationale for request:
Integration of Technical and Professional Skills

This seminar will inform students how to apply core concepts in entrepreneurship to a new venture or academic research. Students will use the Lean Launchpad approach to identify and validate problems and to arrive at executable research or a commercial solution. The intended learning outcome for the milestone:

- Define the lean canvas and explain its purpose.
- Distinguish and summarize the difference between the product and market, understand their fit and articulate the definition of: key metrics, unique value proposition, unfair advantage, channels, customer segments, cost structure and revenue streams.
- Construct customer profiles; engage in customer development and product market validation for an academic project or new venture.
- Develop an applicable intellectual property strategy to their product and idea.
- Assemble a pitch and be able to effectively present and articulate their business idea or research project clearly.
- Provide alternative views to expand and support their research and testing.

Prepared by: Date: Click here to enter a date.
Faculty: Math
Effective term: Term/Year Spring 2017

Course ☐ New ☐ Revision ☐ Inactivation ☐
Milestone ☒ New ☒ Revision ☐ Inactivation ☐

New milestone title: Graduate Diploma Seminar

For course revisions, indicate the type(s) of changes:
(e.g. consent, description, title, requisites)

Course Subject code: Choose an item. Course number:
Course Title (max. 100 characters incl. spaces):
Course Short Title (max. 30 characters incl. spaces):
Grading Basis: Choose an item.
Course Credit Weight: Choose an item.
Course Consent Required: ☐ Choose an item.

Course Description:
New course description (for revision only):

Meet Type(s): Choose an item. Choose an item. Choose an item. Choose an item.
Primary Meet Type: Choose an item.
Requisites:

Special topics course: Yes ☐ No ☐
Cross-listed: Yes ☐ No ☐

Course Subject(s) to be cross-listed with and approval status:
Sections combined/held with:

Rationale for request:

Standards and Certification Seminar

This milestone will focus on the importance of standards and certification when introducing new technologies to the marketplace and the avenues for standardization and certification of quantum-safe cryptographic technologies.

Students will develop an understanding of several components of these topics including:
• Standards
• Relevance
• Importance for deployability
• Competitiveness
• Large-scale adoption
• Compliance organizations and development

Prepared by: Date: Click here to enter a date.
Faculty: Math
Effective term: Term/Year Spring 2017

Course ☐ New ☐ Revision ☐ Inactivation ☐
Milestone ☒ New ☒ Revision ☐ Inactivation ☐

New milestone title: Graduate Diploma Seminar
For course revisions, indicate the type(s) of changes:
(e.g. consent, description, title, requisites)

Course Subject code: Choose an item. Course number:
Course Title (max. 100 characters incl. spaces):
Course Short Title (max. 30 characters incl. spaces):
Grading Basis: Choose an item.
Course Credit Weight: Choose an item.
Course Consent Required: ☐ Choose an item.

Course Description:
New course description (for revision only):

Meet Type(s): Choose an item. Choose an item. Choose an item. Choose an item.
Primary Meet Type: Choose an item.
Requisites:

Special topics course: Yes ☐ No ☐
Cross-listed: Yes ☐ No ☐

Course Subject(s) to be cross-listed with and approval status:
Sections combined/held with:

Rationale for request:

Technical Skills Seminar

The goal of this seminar is to teach the students about the Technical Skills required to become Highly Qualified Personel (HQP) in quantum safe cryptography. The seminars will cover the following technical skills areas:

- Network security
- (Conventional) Cryptography
- Post-quantum cryptography
- Quantum cryptography theory
- Implementation of quantum communication
- Quantum computation

Prepared by:
Appendix D
Curriculum Vitae

Bartholomew, Rachel
Beynon, Wm Douglas
Hurwitz, Marc
Jao, David
Jennewein, Thomas
Lutkenhaus, Norbert
Menezes, Alfred
Mosca, Michele
Weber, J. Mark
UNIVERSITY OF WATERLOO

GRADUATE EXPEDITED PROPOSAL
OF THE

Graduate Diploma in Climate Risk Management

Submitted to the
Ontario Universities Council on Quality Assurance
[date]

VOLUME I – PROPOSED BRIEF
Program Name: Graduate Diploma in Climate Risk Management
Degree Designation: Type 3 Graduate Diploma
Date of Review:
Date of appraisal committee Meeting:
Lead Reviewer:
Brief Description and Rationale

Current climate variability and extreme weather impose impacts on societies and economic sectors worldwide. Suboptimal adaptation to current climate conditions will be exacerbated by ongoing and accelerating global climate change. The challenges posed by anthropogenic climate change affect all sectors of Canadian society and the economy. Individuals, businesses, municipalities and sectors are tasked with making decisions to manage climate change risks by reducing emissions of greenhouse gases (mitigation) and addressing the impacts of changing weather and climate (adaptation). Increasingly, professionals from all disciplines and sectors are asked to include climate change considerations in their ongoing operations. A summary of workforce needs is included in Section V.

The proposed Graduate Diploma in Climate Risk Management (GDip CRM) is designed to meet the needs of early to mid-career professionals who have been tasked with climate change risk management as part of their regular professional duties. The proposed Graduate Diploma will focus on applied skills that are of relevance to multiple disciplines and professions. It will be delivered fully on-line to facilitate upskilling of employed professionals who are not in a position to take a full year leave for a more comprehensive on campus degree program, such as the University of Waterloo’s existing Master of Climate Change (MCC degree).
I. Objectives of the Program

Graduates of the Graduate Diploma in Climate Risk Management (GDip CRM) will possess competence in the science of climate change and associated mitigation and adaptation challenges and response strategies at the global and Canadian scales, and gain in-depth expertise in applied climate risk management.

The University of Waterloo’s Strategic Plan (2013-2018) recognizes that “for a fast-evolving globe, where the pace of emerging challenges often outstrips available answers, conventional approaches to higher education, innovation and discovery are not enough”, and emphasizes “interdisciplinary approaches and a single-minded and forward-looking focus on advancing knowledge and meeting society’s needs”. A key pillar of this approach is a focus on experiential education and entrepreneurship education and practice. The University strives for continuous new program development “to address new knowledge demands that arise from societal change”1.

The Faculty of Environment’s Strategic Plan echoes the University’s strategic goals, and sets out objectives for outstanding academic programming in environment and sustainability. In particular, these objectives include responding to emerging societal needs by focusing growth on graduate education, designing and delivering sustainability-related curriculum for both on campus and off-campus audiences, working across departments and schools, partnering with external stakeholders to enrich our programming, and maintaining a flexible learning environment2.

The GDip CRM is closely aligned with both the University and Faculty Strategic Plans by providing applied curriculum to prepare graduates to meet the evolving societal challenges of climate change. The program is designed for those already in the labour force and those with an undergraduate degree who need some additional applied competence in climate risk management. It will be housed in the Department of Geography and Environmental Management, which already hosts Canada’s only Master of Climate Change degree, and includes contributions from the School of Planning and external experts where additional industry professionals are needed to meet graduate degree level expectations in rapidly developing areas of professional practice. The courses to be developed as part of the Diploma will use the existing Master of Climate Change course codes (GEMCC); however, some individual courses developed for the GDip CRM will be cross-listed with the School of Planning, the Department of Geography and Environmental Management, and the School of Environment, Enterprise and Development. All courses for the GDip CRM will be fully online.

As a fully on-line Type 3 Graduate Program, the GDip CRM is targeted at those with a Bachelor’s Degree in any discipline. The Learning Outcomes of the GDip CRM have been mapped against the Ontario Council of Academic Vice-Presidents (OCAV) Graduate Degree Level Expectations (GDLEs) (see Section VII). The University of Waterloo’s GDLEs, however, emphasize Research and Scholarship (GDLE 2 in Table 1, Section VII) for degree granting Masters Programs more than is possible or desirable in this Graduate Diploma.

The GDip will require graduates to develop:

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1 https://uwaterloo.ca/strategic-plan/

1. Competence in climate science, the risks and opportunities posed by a changing climate, and global and national policies and strategies to mitigate and adapt to anthropogenic climate change.
2. In-depth applied knowledge and skills in three of the following areas of climate risk management practice: accessing and interpreting climate data (climate analytics), incorporating climate change into business decisions, managing climate risk as part of professional planning, and greenhouse gas accounting and management.

II. Admission Requirements

As a Type 3 Graduate Diploma, admission to the program will not require concurrent admission to a degree-granting graduate program. Admission requirements are:

- A 4 year (Honours) Bachelor Degree (or equivalent) in any humanities, social science, health, engineering or science discipline with an overall average of at least 75% in the last 20 courses (or last two years),
- Applicants whose first language is not English must demonstrate command of the English language with a minimum internet-based TOEFL score of 100 (writing 26; speaking 26) or the equivalent on a comparable test such as IELTS 7.5 (writing 7.0; speaking 7.0), and
- Two letters of reference (either professional or academic).

III. Program Structure and Diploma Requirements

The proposed GDip CRM requires the completion of four courses from the list in Section V. GEMCC 600 (Fundamentals of Climate Change) is required unless students can demonstrate equivalent competence (e.g. through undergraduate climate change courses and/or equivalent professional experience). Candidates choose three of the four remaining courses, or all four if they are able to demonstrate competence and opt out of GEMCC 600.

Candidates must pass all courses (minimum 60%). Additionally, in accordance with Faculty of Environment graduate-level coursework requirements, candidates must obtain a minimum average of 70% across all four courses.

Online courses will be offered in all three of the University of Waterloo’s academic terms. Enrolment will be on a per course basis. It is expected that courses will be offered as follows:

- GEMCC 600 Fundamentals of Climate Change Fall
- GEMCC 620 Climate Analytics Winter
- GEMCC 650 Business and Climate Change Spring
- GEMCC 652 Climate Change and Community Planning Spring
- GEMCC 660 Carbon Accounting and Management Fall

It will be possible to complete all Diploma requirements in one year; however, it is expected, given the mid-career professional focus, that candidates will complete one course at a time, and thus normal time to completion will be four or five terms.
Candidates can begin the GDip CRM in any term (provided that competence in climate change fundamentals is demonstrated).

IV. Workforce Needs Assessment

Article 11 of the 2016 Paris Agreement on Climate Change calls for enhanced capacity building to ensure that countries have the necessary skills and knowledge to implement their nationally determined strategies to reduce greenhouse gas emissions and enhance climate resilience of their communities and economies. In Article 12, signatory countries (including Canada) commit to “taking measures, as appropriate, to enhance climate change education, training, public awareness, public participation and public access to information”. Ontario’s 2015 Climate Change Discussion Paper stressed “managing the risks of climate change is the only path to sustained economic growth”. The document emphasizes the need for the Province to “integrate economic and environmental considerations into our decision-making process that consider the risks associated with a changing climate” and stresses the need for both market-based instruments for climate action and planning for low-carbon and climate-resilient communities. The transition to a low carbon and climate-competitive economy has created a growing need for specialized education and training across nearly all industry sectors, what some refer to as the emerging “Climate Industry Sector”. The proposed Graduate Diploma in Climate Risk Management will specifically address the need for this emerging and important sector of work.

A number of international education, training and workforce needs assessments have concluded that climate change has far-reaching implications for the quantity and location of labour and contributes to the rising demand for increasingly educated and highly skilled employees in several sectors and professions (International Labour Office 2008 – Skills for Green Jobs; European Commission 2009 – Climate Change and Employment in the EU-25 to 2030; UK Government 2010 – Meeting the Low-Carbon Skills Challenge; International Labour Office 2010 – Climate Change, Its Impacts on Employment and Labour Markets; International Labour Office 2010 – A Skilled Workforce for Strong, Sustainable and Balanced Growth). The workforce needs assessments also conclude that climate policy has remained largely blind to associated training and employment transition needs. The International Labour Office (2010) and the Government of Australia’s Senate Inquiry into the Effects of Climate Change on Training and Employment Needs additionally highlight the need for broad access to training opportunities and continuous workplace training (often termed “upskilling”) to adjust to an increasingly rapid pace of change. The Environmental Association of Universities and Colleges

5 ec.europa.eu/social/BlobServlet?docId=3124&langId=en
6 webarchive.nationalarchives.gov.uk/…/Meeting-the-low-carbon-skills-challenge.pdf
7 www.uncclearn.org/sites/default/files/inventory/il002.pdf
emphasizes the roles and opportunities for universities to meet training needs. These demands can be met with specialized post-graduate programs and professional short courses for specific economic sectors and professions. A 2014 survey of University of Wisconsin Extension personnel indicated that the top three greatest needs are new educational resources, help with interpreting climate change, and access to climate and weather data. Similarly, a 2010 survey of over 1000 professionals by the Greenhouse Gas Institute emphasizes a need for greater skills in greenhouse gas accounting and management. This need is particularly great in Canada as regional emission reduction programs such as the Western Climate Initiative and Ontario’s new Cap and Trade Initiative will need highly qualified professionals with specialized skills as the first compliance period opens in 2017.

Currently, there is only one specialized degree program in Canada that is largely focused on climate change: the University of Waterloo’s Master of Climate Change (MCC) program (see Section IX for the relationship between the existing MCC and proposed GDip CRM programs). There is currently no applied (non-degree graduate level) program aimed specifically at upskilling existing professionals. This is a major gap in the education market, and one that is recognized by multiple Canadian Professional Associations. The two existing degree programs are residency based, introducing challenges for those in smaller, more remote centres and/or those who must balance existing careers with climate change related upskilling. The proposed GDip CRM has been designed to explicitly respond to this need through both content (Section VI) and delivery format (Section VII).

V. Program Content

The GDip CRM includes a course in the basic science and policy of climate change, as well as core mitigation and adaptation challenges, two courses that have direct application to planning and business professionals, a course on accessing and interpreting climate data, and a course on greenhouse gas accounting and management to meet diverse workforce needs.

The following five on-line graduate courses are part of the proposed graduate diploma program. All courses will be ready no later than May 1, 2018, and may be offered as GEMCC electives for existing MCC and other environment graduate students before the GDip CRM is approved.

Diploma candidates are required to complete GEMCC 600 or demonstrate equivalent competence in Fundamentals of Climate Change (e.g. through completed undergraduate courses in science, mitigation and adaptation of climate change) and choose three of the four applied electives (candidates who do not complete GEMCC 600 will need to complete all four applied electives).

Section VII maps the five courses against GDLEs.

Development of the five courses is led by a mix of tenured University of Waterloo faculty members and, given the specialized nature of some of the courses, industry and government experts. Where

10 www.eauc.org.uk/file_uploads/meeting_the_low_carbon_skills_challenge.pdf
external experts are engaged, tenured Waterloo faculty will collaborate on course design and content throughout the development process. Additionally, “guest experts” (leading professionals in various fields) will provide “state of the field” testimonials on key challenges and trends in professional practice throughout the program. Resources for these have already been secured (see Section IX).

**GEMCC 600 Fundamentals of Climate Change**

This course will provide students from any disciplinary and professional background with competence on the global climate challenge, including the scientific underpinnings; potential impacts on natural systems, economic sectors, and human societies around the world; and the two broad categories of societal responses, adaptation and greenhouse gas mitigation. Canadian (federal and provincial) and relevant international climate policy is reviewed. The course (or equivalent competence) is required for completion of the GDip CRM to ensure students develop a shared holistic understanding of key concepts/terminology and the developing science that influences the policy environment within which action on climate change occurs.

Development of GEMCC 600 is led by Dr. Sarah Burch, Associate Professor in Geography and Environmental Management and Canada Research Chair in Sustainability Transitions. Dr. Burch is the lead author of *Understanding Climate Change: Science, Policy and Practice* and was the co-instructor of the first international Massive Open Online Course on climate change in 2013.

**GEMCC 620 Climate Analytics**

This course focuses on the scientific and practical challenges of utilizing climate data for decision-making, as well as the professional ethics associated with providing climate services. Through lectures, videos, guest speakers and technical assignments this course explores how both historical data and climate change scenarios can be used to assess climate risk in a variety of sectors, including a range of decision support tools.

Development of GEMCC 620 is complete as of May 2017. The development was led by Dr. Brad May (PhD expected Fall 2017 PhD thesis on Polycentric Leadership in Climate Adaptation). Dr. May is a former Program Manager with Environment Canada’s (Climate) Adaptation and Impacts Research Group, with a federal government career in climate-related research and policy from 1986 to 2012. He has taught at the University of Waterloo since 2012. As Dr. May is not a tenured faculty member, Drs. Jean Andrey and Daniel Scott were consulted on course design and content.

**GEMCC 650 Business and Climate Change**

This course examines the intersection of business management, climate change, and the evolving policy environment within which mitigation and adaptation occurs. A Canadian lens is applied to understanding climate change business economics, the changing policy and regulatory landscape at the international, national and provincial level, the ways in which a price on carbon and the need to disclose carbon and climate risk can affect business decision-making, and the various opportunities for companies to reduce their carbon footprint to operate in emerging low-carbon economies, make their business more resilient to the impacts of climate change, and identify value-creation opportunities. Leadership cases from businesses worldwide will be explored, including multi-national and small and medium sized enterprises.

Development of GEMCC 650 is led by Dr. Marisa Beck. Dr. Beck is currently a post-doctoral research associate at the University of Ottawa, and her (2017) PhD thesis focused on integrated assessment models for climate governance. Prior to her doctoral work, she was the Lead Analyst for Global Carbon Markets with Bloomberg Finance in London (UK) and a Climate Change Policy Advisor with
Germanwatch. Dr. Daniel Scott and Drs. Neil Craik and Jason Thistlethwaite from the School of Environment, Enterprise and Development were consulted on course design and content.

**GEMCC 652 Climate Change and Community Planning**
Climate change has complex implications for communities across Canada and Planners are at the forefront of developing and implementing strategies to both reduce greenhouse gas (GHG) emissions and build resilience to current and future climate. This course focuses on some of the opportunities and challenges associated with the integration of climate change into urban and rural planning, including climate vulnerability of urban systems, low-carbon transport systems, urban greening and green infrastructure for climate resilience, regenerative designs that reduce social vulnerability, the role of information and communication technologies for system efficiency and resilience, and assessing synergies and conflicts between mitigation and adaptation. Leading policy and design cases from communities across Canada and internationally will be examined.

Development of GEMCC 652 is led by Dr. Mark Seasons, Professor in the School of Planning. Dr. Seasons is a member of the Canadian Institute of Planners, a past recipient of a distinguished teacher award at the University of Waterloo, and an active researcher with projects including local government needs for resilience and adaptation to climate change.

**GEMCC 660 Carbon Accounting and Management**
Carbon management is fundamental to achieving international and national policy objectives to avoid dangerous climate change. With more jurisdictions implementing carbon pricing and cap and trade programs, carbon accounting and reporting is rapidly expected to become a central part of the global business environment. This course focuses on best practices in GHG measurement and management from the perspective of a business or organization. The course includes organization emission reduction target setting strategies; techniques and standards for organizational GHG inventories with reference to international-regional-sectoral reporting/trading schemes; auditing and verification processes; GHG information management systems; evolving expectations and approaches to disclosure of GHG emissions; supply-chain carbon accounting; and evolving carbon markets (voluntary, sectoral and regulated).

Development of GEMCC 660 is led by HRCarbon (Director Jay Parmar), a corporate sustainability and climate change management consulting firm based in Toronto. Mr. Parmar holds an MSc from the London School of Economics, and HRCarbon’s core competence is to measure, analyze, report and integrate corporate sustainability. HRCarbon has extensive experience in GHG accounting training, and the course will provide students the necessary experience to sit for a professional credential exam such as the Canadian Standards Association (CSA). Drs. Daniel Scott, Johanna Wandel and Jean Andrey will work with HRCarbon to ensure graduate degree level expectations are met in this course.
VI. Mode of Delivery and Degree Level Expectations

The proposed GDip CRM will be fully online. Courses will be developed by a team of a UW faculty members and external professional experts together with an online learning consultant, online developer and quality assurance specialist from the Centre for Extended Learning (CEL) at the University of Waterloo. CEL has a long track record of preparing high quality, engaging online courses. The University of Waterloo currently offers over 300 online and two dozen fully online degrees, certificates and diplomas.

CEL follows a set of User Experience Design for Learning (UXDL)\(^{15}\) principles, which are focused on useful, desirable, accessible, credible and navigable learning. Useful here means content that is built to engage through verbal and visual channels which help students select, organize and integrate information. Desirable design focuses on aesthetic beauty, function and reflective design. Accessible principles are met by following Web Content Accessibility Guidelines. Credible courses have quality content from Subject Matter Experts who are leading in their field. Navigability will be ensured through sound design and consistent navigation templates across all five GDip CRM courses.

As a result of significant external resources contributing to the GDip CRM (see Section IX), at least two of the proposed courses will be tested with for-credit graduate students enrolled in the MCC program prior to the launch of the proposed GDip CRM. Feedback from this testing phase as well as ongoing feedback after the program is implemented will allow for continuous enhancement of the online user experience and the effectiveness of the online delivery format for graduate education.

Delivery of the GDip CRM courses is asynchronous – that is, students are not tied to the particular schedule of the course beyond the 12-week teaching term and its associated assignment deadlines. Students are given access to all the course content at the outset, though in some cases completion of one component may be required to “unlock” and progress further components. Participants, however, are free to arrange their time to fit around existing professional obligations; asynchronous delivery frees course participants from time zone constraints. Best practices for asynchronous learning will be followed, including the use of online discussion boards for group interaction within courses. All academic support materials will be accessed through the online learning management system, including library materials, which will be facilitated via direct link on each course’s home page. Additionally, as registered University of Waterloo students, GDip candidates will have full access to University of Waterloo electronic library resources.

Although the completion of the GDip CRM does not lead to the awarding of a Masters degree, the program and its courses has been designed to meet Masters Graduate Degree Level Expectations (GDLEs) to ensure a) that these courses deliver content appropriate to post-undergraduate training; and b) that these courses can be used as electives in related programs to ensure sustainability of resourcing of the GDip CRM (see Section IX).

Table 1 lists the University of Waterloo’s Masters GDLEs, which are based directly on the Ontario Council of Academic Vice Presidents (OCAV) GDLEs\(^{16}\) and the associated Learning Outcomes mapped to GDLEs for the GDip CRM.

\(^{15}\) http://cel.uwaterloo.ca/honeycomb/

\(^{16}\) https://uwaterloo.ca/centre-for-teaching-excellence/teaching-resources/curriculum-development-and-renewal/program-review-accreditation/8-degree-expectations
Table 1: GDLEs and Learning outcomes for the Graduate Diploma in Climate Risk Management

<table>
<thead>
<tr>
<th>Expectations</th>
<th>Master’s Degree</th>
<th>Learning Outcomes GDip CRM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Depth and Breadth of Knowledge</td>
<td>A systematic understanding of knowledge and a critical awareness of current problems and/or new insights, much of which is at, or informed by, the forefront of their academic discipline, field of study, or area of professional practice;</td>
<td>Broad interdisciplinary knowledge of the concepts, information and techniques relevant to three main dimensions of climate change research and practice (climate science, vulnerability and adaptation; emissions and mitigation) GEMCC 600</td>
</tr>
<tr>
<td>2. Research and Scholarship</td>
<td>A conceptual understanding and methodological competence that:</td>
<td>The GDip does not lead to a Masters degree and consequently does not focus on research and scholarship, but candidates will be able to utilize terminology that facilitates interdisciplinary research on climate change and draw on multiple fields of inquiry to address complex scientific and social challenges related to climate change. Courses require the development and application of arguments and analyses in written form (GEMCC 600, GEMCC 620, GEMCC 650, GEMCC 652, GEMCC 660)</td>
</tr>
<tr>
<td></td>
<td>i) Enables a working comprehension of how established techniques of research and inquiry are used to create and interpret knowledge in the discipline;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ii) Enables a critical evaluation of current research and advanced research and scholarship in the discipline or area of professional competence;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>iii) Enables a treatment of complex issues and judgments based on established principles and techniques; and,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>On the basis of that competence, has shown at least one of the following:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>i) The development and support of a sustained argument in written form; or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ii) Originality in the application of knowledge.</td>
<td></td>
</tr>
<tr>
<td>3. Level of Application of Knowledge</td>
<td>Competence in the research process by applying an existing body of knowledge into the critical analysis of a new question or of a specific problem or issue in a new setting.</td>
<td>Ability to extract and interpret climate projections and historical climate data (GEMCC 620); apply specialized knowledge and skills to independent projects in Business (GEMCC 650), Planning (GEMCC 652) and Carbon Accounting (GEMCC 660).</td>
</tr>
<tr>
<td>4. Professional Capacity/Autonomy</td>
<td>a. The qualities and transferable skills necessary for employment requiring:</td>
<td>GDip candidates in many cases will be early to mid-career professionals who will enhance their ability to make decisions in complex situations through specialized skills enhancement (GEMCC 620, GEMCC 650, GEMCC 652, GEMCC 660).</td>
</tr>
<tr>
<td></td>
<td>i) The exercise of initiative and of personal responsibility and accountability;</td>
<td>Ability to appreciate broader implications of climate change (GEMCC 600) and ability to apply this knowledge in particular contexts (GEMCC 620, GEMCC 650, GEMCC 652, GEMCC 660)</td>
</tr>
<tr>
<td></td>
<td>ii) Decision-making in complex situations;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. The intellectual independence required for continuing professional development;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. The ethical behavior consistent with academic integrity and the use of appropriate guidelines and procedures for responsible conduct of research; and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. The ability to appreciate the broader implications of applying knowledge to particular contexts.</td>
<td></td>
</tr>
<tr>
<td>5. Level of Communications Skills</td>
<td>The ability to communicate ideas, issues and conclusions clearly.</td>
<td>The production of professional quality written reports summarizing quantitative and qualitative</td>
</tr>
</tbody>
</table>
VII. Assessment of Teaching and Learning

Assessment of Teaching and Instructor Effectiveness

The GDip CRM course evaluation plan will include collection and analysis of the following data:

- Students are asked to complete course evaluations of online courses during the last two weeks of term using the University of Waterloo’s standard, online evaluation instrument. This instrument includes specific questions for both the course and instruction.
- The number and type of technical help requests for each course will be logged and evaluated by the design team.
- Instructors will have the ability to add individual feedback questions throughout the course content, assessing student satisfaction with content presentation, order, and effectiveness.
- The curricular committee (see Section IX) will meet on a regular basis to discuss overall student achievement and satisfaction in the program.

Course design improvements and enhancements will be made after student and instructor feedback after initial and subsequent offers; online courses are normally completely reviewed and potentially fully redesigned after five years.

Assessment of Learning

Each course has its own specific learning outcomes, consistent with the learning outcomes listed in Table 1. Each course will use unique evaluation tools, but in all cases, assessment of learning and feedback will be more frequent than in traditional face-to-face courses given the asynchronous distance environment. The four elective courses will all include the preparation of an independent, professional report (e.g. a greenhouse gas inventory and reduction strategy for a real-world company for GEMCC 660) plus multiple smaller assignments and quizzes. Specific evaluation tools are at the discretion of the instructor; however, evaluation in all courses will be examined by the curriculum committee.

VIII. Resources

Resources for the design and delivery of the GDip CRM are mostly in place already. The existing MCC program, part of the Department of Geography and Environmental Management (GEM), has already led to a strengthening of research and teaching competence in climate change through the addition of two new tenure stream faculty in 2013. Additional competence exists within the School of Planning (SoP) and the School of Environment, Enterprise and Development (SEED). Additional human resources from the government and private sector in the areas of Business and Climate Change, Climate Analytics and Carbon Accounting are necessary to ensure professional relevance, but these have already been secured.
The Faculty of Environment, under the leadership of Dean Jean Andrey, successfully secured $330,000 from eCampus Ontario for the complete development of the GDip CRM courses from January 2017 to March 2018. This budget includes course release time for tenure-stream University of Waterloo faculty involved with this initiative (Wandel, Seasons, Burch), compensation for external subject matter experts (HRCarbon, May, Beck), professional time for CEL online learning consultants, course designers and quality assurance professionals, accessibility and compliance costs, and honoraria and travel costs for guest experts used in online courses. Finally, resources are in place for in-depth testing of two courses with existing graduate students (GEMCC 620 and GEMCC 650, which were developed using this funding January-June 2017) in Winter 2018.

The timelines for course development are somewhat unusual for a Graduate Diploma approval as courses will be completely developed before the diploma is fully approved given the requirements of the eCampus funding. Consequently, two of the courses have already been submitted to Environment Faculty Council for approval to facilitate Winter 2018 testing. This strategy does not incur additional risk as the new GEMCC courses can serve as electives for existing Faculty of Environment graduate programs.

In particular, we expect synergies between the MCC and the GDip program. All new GEMCC courses except GEMCC 600 will become approved electives for MCC. The MCC is a traditional masters program with research requirements and a stronger theoretical foundation through three required core courses which must be completed in the Fall term (these in person courses are not available to GDip CRM candidates, GEMCC 600 is designed to cover the same content with a more applied focus.)

Ongoing management of the GDip CRM will be administered in conjunction with MCC. It is expected that the MCC Director (currently Scott, in future either Scott or Wandel) will manage both programs. Additionally, a curricular committee composed of the Director of GDip CRM, at least one core MCC instructor (Wandel, or alternate if Wandel is Director) and the Associate Dean of Graduate Studies will regularly evaluate the structure and content of courses with respect to student and instructor feedback and current relevance to ensure that the GDip continues to meet its upskilling objectives.

MCC currently has 0.5 FTE of administrative support from Ms. Teresa Wilson, as MCC and GDip enrolment grows, this may necessitate an increase in support staff time which will be offset by new tuition revenue.

Ongoing online teaching will be provided by a mixture of tenured faculty who will complete this as part of their regular teaching load (Burch, Seasons) and contract faculty with particular professional expertise. In all cases, the course subject matter expert (HRCarbon, Beck, May) will be approached for initial delivery; beyond this, as the program grows, tenure stream faculty with expertise in particular areas (e.g. business and climate change, climate analytics) may have their teaching load adjusted in consultation with the Dean and unit heads. The Dean of Environment is committed to meeting the ongoing financial needs of the GDip CRM.

No further physical resources are needed given the online delivery of the program and the existing CEL structure, which includes regular technical support for both instructors and students, and the University of Waterloo Library’s significant e-resources.

IX. Quality and Other Indicators
The quality and experience of faculty and associated professional experts is outlined in the CVs contained in Volume II of this Brief. Course developers come from a variety of disciplinary backgrounds including geography, business, planning and analysis design and management of information systems that are germane to this diverse field of research and professional practice. The curriculum committee is committed to ensuring consistency and quality across the necessarily interdisciplinary GEMCC courses. Both Scott (as Director of MCC since its launch in 2013 and current Director of the Interdisciplinary Centre on Climate Change) and Wandel (as Interim Chair of GEM in 2016) have the necessary administrative expertise to ensure smooth operation of this program.
UNIVERSITY OF WATERLOO

GRADUATE EXPEDITED PROPOSAL
OF THE

GRADUATE DIPLOMA
IN
CLIMATE RISK MANAGEMENT

SUBMITTED TO THE
ONTARIO UNIVERSITIES COUNCIL ON QUALITY ASSURANCE

VOLUME II - CURRICULA VITAE OF THE FACULTY

DECEMBER 2017
CURRICULA VITAE
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Volume II Curricula Vitae (see agenda item 4b)
Prior to form submission, review the content revision instructions and information regarding major/minor modifications. For questions about the form submission, contact Trevor Clews, Graduate Studies Office.

Faculty: Environment

Program: Graduate Diploma (GDip) in Climate Risk Management (direct entry)

Program contact name(s): Johanna Wandel

Form completed by: Teresa Wilson

Description of proposed changes:

Note: changes to courses and milestones also require the completion/submission of the SGRC Course/Milestone-New/Revision/Inactivation form (PC docx version or MAC docx version).

See attached program proposal.

Is this a major modification to the program? Choose an item.

New program.

Rationale for change(s):

See attached program proposal.

Proposed effective date: Term: Fall Year: 2018

Current Graduate Studies Academic Calendar (GSAC) page (include the link to the web page where the changes are to be made):

https://uwaterloo.ca/graduate-studies-academic-calendar/environment/department-geography-and-environmental-management

<table>
<thead>
<tr>
<th>Current Graduate Studies Academic Calendar content:</th>
<th>Proposed Graduate Studies Academic Calendar content:</th>
</tr>
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<tbody>
<tr>
<td>No current content.</td>
<td>Graduate Diploma (GDip) in Climate Risk Management (direct entry)</td>
</tr>
<tr>
<td></td>
<td>Program information</td>
</tr>
<tr>
<td></td>
<td>• Admit term(s)</td>
</tr>
<tr>
<td></td>
<td>o Fall</td>
</tr>
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<td></td>
<td>o Winter</td>
</tr>
<tr>
<td></td>
<td>o Spring</td>
</tr>
<tr>
<td></td>
<td>• Delivery mode</td>
</tr>
<tr>
<td></td>
<td>o Online</td>
</tr>
<tr>
<td>Program type</td>
<td>Diploma</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Registration option(s)</td>
<td>Part-time</td>
</tr>
<tr>
<td>Study option(s)</td>
<td>Coursework</td>
</tr>
</tbody>
</table>

**Admission requirements**

- Minimum requirements
  - A four year Honours Bachelor degree or equivalent in any humanities, social science, health, engineering or science discipline with an overall average of at least 75% in the last 20 courses (or last two years).

- Application materials
  - Résumé/Curriculum vitae
  - Supplementary information form
  - Transcript(s)

- References
  - Number of references: 2
  - Type of references: professional or academic

- **English language proficiency (ELP)** (if applicable)

**Degree requirements**

**Coursework option:**

- **Graduate Academic Integrity Module (Graduate AIM)**
- Courses
  - Students must complete 4 courses from the following list:
    - GEMCC 600 Fundamentals of Climate Change
    - GEMCC 620 Climate Analytics
    - GEMCC 650 Business and Climate Change Spring
    - GEMCC 652 Climate Change and Community Planning
    - GEMCC 660 Carbon Accounting and Management
  - GEMCC 600 Fundamentals of Climate Change is required unless students can demonstrate equivalent competence (e.g. through undergraduate climate change courses and/or equivalent professional experience). Students choose 3 of the
<table>
<thead>
<tr>
<th>Current Graduate Studies Academic Calendar content:</th>
<th>Proposed Graduate Studies Academic Calendar content:</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 remaining courses, or all 4 courses if they are able to demonstrate competence and opt out of GEMCC 600.</td>
<td>4 remaining courses, or all 4 courses if they are able to demonstrate competence and opt out of GEMCC 600.</td>
</tr>
<tr>
<td>o Students must pass all courses with a minimum 60%. Additionally, in accordance with Faculty of Environment graduate-level coursework requirements, students must obtain a minimum average of 70% across all 4 courses.</td>
<td>o Students must pass all courses with a minimum 60%. Additionally, in accordance with Faculty of Environment graduate-level coursework requirements, students must obtain a minimum average of 70% across all 4 courses.</td>
</tr>
<tr>
<td>• Link(s) to courses</td>
<td>• Link(s) to courses</td>
</tr>
<tr>
<td>o Geography &amp; Environmental Management, Climate Change (GEMCC) courses</td>
<td>o Geography &amp; Environmental Management, Climate Change (GEMCC) courses</td>
</tr>
<tr>
<td>o Graduate course search</td>
<td>o Graduate course search</td>
</tr>
</tbody>
</table>

How will students currently registered in the program be impacted by these changes?

_Not applicable._

Departmental approval date (11/17/17): _Not applicable._
Reviewed by GSO (for GSO use only) ❑ date (11/22/17):
Faculty approval date (11/30/17):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if applicable):
Senate Undergraduate Council met on 19 December 2017 and agreed to forward the following items to Senate for approval. Council recommends these items be included in the regular agenda.

Further details are available: https://uwaterloo.ca/secretariat/committees-and-councils/senate-undergraduate-council

FOR APPROVAL

___________________________________

CHANGES TO ACADEMIC PLANS

Faculty of Arts
Articulation Agreement

**Motion:** That Senate approve the proposed admission standards for the Honours Bachelor of Arts, Honours Arts and Honours Bachelor of Arts, Social Development Studies outlined in the attached articulation agreement with Conestoga College Institute of Technology and Advanced Learning (“Conestoga”), effective 1 September 2018.

**Rationale:** This agreement allows eligible graduates of the one-year General Arts and Science Certificate or the two-year General Arts and Science Diploma at Conestoga to transfer into the Honours Bachelor of Arts, Honours Arts or Honours Bachelor of Arts, Social Development Studies on the terms of the attached. Arts has good data on the success of students transferring from college programs, and already has a number of articulation agreements in place with other Ontario colleges. See Attachment #1.

/rmw

Mario Coniglio
Associate Vice-President, Academic
Articulated Admission and Transfer Credit Agreement

between

University of Waterloo
Faculty of Arts
Waterloo, Ontario, Canada

and

Conestoga College Institute of Technology and Advanced Learning
School of Liberal Studies
Kitchener, Ontario, Canada

WHEREAS, University of Waterloo and Conestoga College Institute of Technology and Advanced Learning have developed this transfer credit agreement (the “Agreement”) with the purpose of facilitating the educational mobility and transfer of students from Conestoga College Institute of Technology and Advanced Learning to University of Waterloo.

WHEREAS, University of Waterloo and Conestoga College Institute of Technology and Advanced Learning enter into this Agreement as cooperating, equal partners who shall maintain the integrity of their separate programs while working to ensure a smooth curriculum transition for interested and qualified students.

NOW THEREFORE in consideration of the mutual covenants contained herein and other good and valuable consideration, the receipt and sufficient of which is hereby acknowledged, the parties covenant and agrees as follows:

Definitions

In this Agreement, the following terms shall have the following meanings:

“Waterloo” shall mean the University of Waterloo;
“Conestoga” shall mean Conestoga College Institute of Technology and Advanced Learning;
“Arts” shall mean the Honours Arts program offered at Waterloo;
“GAS” shall mean the General Arts and Science program offered at Conestoga.

Article I
Organization Information

Sending Organization
Conestoga
School of Liberal Studies
General Arts and Science – One-Year (1 year certificate program)
General Arts and Science – Diploma Option (2 year diploma program)

Receiving Organization
Waterloo
Faculty of Arts
- Honours Bachelor of Arts, Honours Arts (4 year program)
- Honours Bachelor of Arts, Social Development Studies (4 year program)
Article II
Terms of Agreement

This Agreement shall be effective from the date of signing, and expires on 30 June 2020 unless renewed in accordance with the “Terms for Renewal or Cancellation” section within this Agreement.

The terms of cooperation for each specific activity implemented under this Agreement, including any financial aspects, will be mutually discussed and signed-off by official representatives of both institutions prior to the initiation of that activity.

It is not the intent of this Agreement to create a legally binding partnership, and the participating institutions do not intend to impose financial obligations upon one another. Neither institution has the right to assign any duty or responsibility arising from the Agreement to another institution or individual without the written consent of the other participant.

Intellectual Property Rights

The two institutions here named have independent intellectual property policies:

University of Waterloo

Conestoga College

Students participating in this pathway will fall under the IP policy of the institution that s/he is attending in accordance with the schedule of attendance at the two institutions.

Indemnification

Conestoga shall indemnify and hold Waterloo, its governors, officers, faculty, students, employees, independent contractors, and agents harmless in respect of any claim, demand, action, cause of action, damage, loss, injury, cost, liability or expense, which may be made or brought against Waterloo or which Waterloo may suffer or incur as a result of or arising out of any breach or non-fulfillment of any representations, warranties, covenants, or other contractual obligations under this agreement or any negligence or willful misconduct on the part of Conestoga or anyone for whom Conestoga is responsible at law. Conestoga agrees that the foregoing indemnity shall survive the termination of this Cooperation Agreement notwithstanding any provisions of this Cooperation Agreement to the contrary. Students are not employees of Conestoga or Waterloo for the purposes of this arrangement.

Waterloo shall indemnify and hold Conestoga, its officers, students, employees, independent contractors, and agents harmless in respect of any claim, demand, action, cause of action, damage, loss, injury, cost, liability or expense, which may be made or brought against Conestoga or which Conestoga may suffer or incur as a result of or arising out of any breach or non-fulfillment of any representations, warranties, covenants, or other contractual obligations under this Cooperation Agreement or any negligence or willful misconduct on the part of Waterloo or anyone for whom Waterloo is responsible at law. Students are not employees of Conestoga or Waterloo for the purposes of this arrangement.

Miscellaneous

Items not covered by this Agreement may be determined and negotiated separately by both institutions without abrogating this Agreement. This Agreement does not prevent additional agreements between the institutions.
The participating institutions will ensure that all in-progress articulation activities will have the opportunity to be completed within a reasonable time frame; however, no new articulations will be undertaken after the expiration date.

**Terms for Renewal or Cancellation**

This agreement will be reviewed annually in March by a committee to ensure that the academic standards of each institute are being adequately met. The committee will be comprised of representation from the partner institutes, and shall ensure that no program or policy changes have occurred that may affect the accuracy of this Agreement, and agree on necessary changes to the Agreement. Two (2) members from both institutes shall be appointed. The committee shall conduct a minimum of one (1) meeting per year, and may include participation by video or audio conferencing.

Beginning in March 2018, and in March every three (3) years thereafter for which this Agreement has been extended, the committee will review performance pursuant to this Agreement. As part of the review, the committee shall incorporate an evaluation of cooperation and a recommendation of necessary changes (where applicable). As a result of the review, the parties may agree to extend this Agreement for an additional three years, beginning on 1 July of the then current year and expiring on 30 June of the third year thereafter. Such extension of this Agreement may be done with or without amendment. If no agreement is reached on extension of this Agreement by 15 June of the then current year, then this Agreement shall expire on 30 June of the then current year.

Any amendments to and renewals of this Agreement shall be done with a view to the integrity of each party’s academic programs, as well as to improve the processes and student articulation implemented under this Agreement, with a view overall to student success. The Agreement may be amended only in writing signed by all parties.

Termination of the agreement, with or without statement of the reasons for termination may be made in writing at any time and shall incorporate a six (6) month notice.

The parties agree that in the event of revision, expiration or termination of this Agreement, students enrolled in the program will have the opportunity to complete the program under the terms of this Agreement.

**Program and Policy Changes**

Conestoga and Waterloo agree to communicate any substantive changes at the annual review to their program including changes in admission standards, graduation requirements, curriculum, course offerings, length of program, hours of instruction, delivery method, co-op or work-integrated learning (where applicable). Substantive change is any change that alters learning outcomes, admission or graduation requirements, or delivery.

Conestoga and Waterloo agree to communicate any policy changes at the annual review which may affect the agreed upon relationship. Such policy changes will be considered during discussions at the time this Agreement is reviewed, as referred to above.

**Organizational Contacts**

The below named individuals are responsible for the development, maintenance and coordination of the Agreement. All notices or communications should be directed to the below named persons.
Article III
Agreement Information

Type of Agreement
Articulated Admission and Transfer Credit Agreement

Transfer Pathway Progression GAS Certificate (1 year)
The following table depicts typical progression for students moving from GAS into the Arts, Regular program.

<table>
<thead>
<tr>
<th>Academic year</th>
<th>Program:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Conestoga GAS</td>
<td>3.5 units of Transfer Credit</td>
<td>Waterloo Arts</td>
<td>Off</td>
<td>Waterloo Arts</td>
<td>Off</td>
</tr>
<tr>
<td>Academic term</td>
<td>F W S</td>
<td></td>
<td>1B</td>
<td>2A</td>
<td>S</td>
<td>2B</td>
</tr>
<tr>
<td>Units per term</td>
<td></td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Unit totals</td>
<td></td>
<td>6.0</td>
<td>8.5</td>
<td>11.0</td>
<td>13.5</td>
<td>16.0</td>
</tr>
</tbody>
</table>

Co-op Note: Upon entry into their first fall term at Waterloo, students interested in departmental co-op programs should immediately contact their Arts Academic Advisor as well as their departmental advisor.
Transfer Pathway Progression GAS Diploma (2 year)
The following table depicts typical progression for students moving from GAS into the Arts, Regular program.

<table>
<thead>
<tr>
<th>Academic year:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program:</td>
<td>Conestoga GAS</td>
<td>Off</td>
<td>Conestoga GAS</td>
<td>Off</td>
<td>Waterloo Arts</td>
</tr>
<tr>
<td>Academic term:</td>
<td>F</td>
<td>W</td>
<td>S</td>
<td>F</td>
<td>W</td>
</tr>
<tr>
<td>Units per term:</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Co-op note: Due to the large amount of transfer credits offered through this agreement, the co-op program is not available due to sequencing issues and the number of credits transferred.

Admission Requirements

General Arts and Science – One-Year

This agreement recognizes that a student who has completed a certificate at Conestoga in the one (1) year GAS program, with a minimum average of 80%, including a minimum of 70% in an acceptable English writing course (COMM 1085), will be eligible for admission into Arts with transfer credits as outlined in this Agreement.

General Arts and Science – Diploma Option

This agreement recognizes that a student who has completed a diploma at Conestoga in the two (2) year GAS program, with a minimum average of 75%, including a minimum of 70% in an acceptable English writing course (COMM 1085), will be eligible for admission into Arts with transfer credits as outlined in this Agreement.

Using the 105D/F form on the Ontario Universities’ Application Centre (OUAC), applicants will apply to the Honours Arts (WA, WJA, WRA codes) program or Honours Social Development Studies (WRS code) program at Waterloo. Conestoga applicants will be required to submit their high school transcript and all post-secondary transcripts, including their final Conestoga transcript showing graduation from the program.

Conestoga graduates will be considered in the same applicant pool as other external transfer students, but will be given preferential consideration over all other college GAS programs where agreements do not exist. Each student’s application and academic record will be assessed on an individual basis.

This Agreement recognizes the high quality of courses that Conestoga students currently take and the confidence Waterloo’s Faculty of Arts has in considering Conestoga graduates for admission.

Transfer Credit General Arts and Science – One Year
Conestoga GAS certificate graduates are eligible for up to 3.5 units of transfer credit (equivalent of 7 courses of 0.5 unit weight).

Transfer credit according to the outline below will be offered to qualified students, transferring from the Conestoga GAS certificate program into the Arts program at Waterloo.

<table>
<thead>
<tr>
<th>Conestoga Course Code</th>
<th>Conestoga Course Title</th>
<th>UW Course Code</th>
<th>Credit Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS 1070</td>
<td>Introduction to Human Relations</td>
<td>BUS 1XX</td>
<td>0.50</td>
</tr>
<tr>
<td>LIBS 1520</td>
<td>Introduction to the Social Sciences</td>
<td>SDS 1XX</td>
<td>0.50</td>
</tr>
<tr>
<td>LIBS 1560</td>
<td>Our Domain: Introduction to World Geography</td>
<td>GEOG 1XX</td>
<td>0.50</td>
</tr>
<tr>
<td>SCIE 1060</td>
<td>Understanding Science</td>
<td>SCI 1XX</td>
<td>0.50</td>
</tr>
</tbody>
</table>

**REQUIRED COURSES UNITS TRANSFERRED:**

<table>
<thead>
<tr>
<th>Conestoga Course Code</th>
<th>Conestoga Course Title</th>
<th>UW Course Code</th>
<th>Credit Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 1010</td>
<td>Biological Sciences</td>
<td>BIOL 1XX</td>
<td>0.50</td>
</tr>
<tr>
<td>LIBS 1110</td>
<td>World Religions</td>
<td>RS 100</td>
<td>0.50</td>
</tr>
<tr>
<td>LIBS 1160</td>
<td>Essentials of Canadian History</td>
<td>HIST 1XX</td>
<td>0.50</td>
</tr>
<tr>
<td>LIBS 1170</td>
<td>Introduction to Astronomy</td>
<td>SCI 237</td>
<td>0.50</td>
</tr>
<tr>
<td>LIBS 1180</td>
<td>Issues in World Affairs</td>
<td>PSCI 150</td>
<td>0.50</td>
</tr>
<tr>
<td>LIBS 1420</td>
<td>Issues in Canadian Politics</td>
<td>PSCI 260</td>
<td>0.50</td>
</tr>
<tr>
<td>LIBS 1500</td>
<td>Aesthetics and Visual Cultures</td>
<td>V CPL 1XX</td>
<td>0.50</td>
</tr>
<tr>
<td>LIBS 1650</td>
<td>Quest for Wisdom</td>
<td>PHIL 1XX</td>
<td>0.50</td>
</tr>
<tr>
<td>LIBS 1660</td>
<td>Viewing Philosophy Through Film</td>
<td>PHIL 1XX</td>
<td>0.50</td>
</tr>
<tr>
<td>LIBS 1690</td>
<td>Applied Organizational Behaviour</td>
<td>PSYCH 238</td>
<td>0.50</td>
</tr>
<tr>
<td>LIBS 1910</td>
<td>Environmental Science</td>
<td>SCI 2XX</td>
<td>0.50</td>
</tr>
<tr>
<td>PSYC 1010</td>
<td>Psychology: Basic Process of Behaviour</td>
<td>PSYCH 1XX</td>
<td>0.50</td>
</tr>
<tr>
<td>PSYC 1090</td>
<td>Social Psychology: Social Relations</td>
<td>PSYCH 1XX</td>
<td>0.50</td>
</tr>
<tr>
<td>PSYC 1140</td>
<td>Positive Psychology</td>
<td>PSYCH 226R</td>
<td>0.50</td>
</tr>
<tr>
<td>SCIE 1050</td>
<td>Introduction to Physical Sciences</td>
<td>SCI 1XX</td>
<td>0.50</td>
</tr>
<tr>
<td>SOC 1030</td>
<td>Sociology I</td>
<td>SOC 101</td>
<td>0.50</td>
</tr>
</tbody>
</table>

**LIBERAL STUDIES ELECTIVE COURSE UNITS TRANSFERRED:**

<table>
<thead>
<tr>
<th>Conestoga Course Code</th>
<th>Conestoga Course Title</th>
<th>UW Course Code</th>
<th>Credit Weight</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

**TOTAL UNITS TRANSFERRED:**

|                      |                                                            |                |               |

Other liberal studies elective courses offered by Conestoga may be assessed and awarded for transfer by the University of Waterloo and are not limited to those assessed and listed in the chart above. Up to 1.5 units of liberal studies elective courses may be awarded into the Arts program at Waterloo.

**Transfer Credit General Arts and Science – Diploma Option**
Conestoga GAS diploma graduates are eligible for up to 9.0 units of transfer credit (equivalent of 18 courses of 0.5 unit weight).

Transfer credit according to the outline below will be offered to qualified students, transferring from the Conestoga GAS program into the Arts program at Waterloo.

<table>
<thead>
<tr>
<th>Conestoga Course Code</th>
<th>Conestoga Course Title</th>
<th>UW Course Code</th>
<th>Credit Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS 1070</td>
<td>Introduction to Human Relations</td>
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<tr>
<td>BIOL 1010</td>
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</tr>
<tr>
<td>LIBS 1520</td>
<td>Introduction to the Social Sciences</td>
<td>SDS 131R</td>
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<tr>
<td>LIBS 1560</td>
<td>Our Domain: Introduction to World Geography</td>
<td>GEOG 1XX</td>
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</tr>
<tr>
<td>LIBS 1160</td>
<td>Essentials of Canadian History</td>
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</tr>
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<td>Psychology: Basic Process of Behaviour</td>
<td>PSYCH 1XX</td>
<td>0.50</td>
</tr>
<tr>
<td>SCIE 1050</td>
<td>Introduction to Physical Sciences</td>
<td>SCI 1XX</td>
<td>0.50</td>
</tr>
<tr>
<td>SCIE 1060</td>
<td>Understanding Science</td>
<td>SCI 1XX</td>
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<tr>
<td></td>
<td>REQUIRED COURSES UNITS TRANSFERRED:</td>
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<td>UP TO</td>
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<tr>
<td></td>
<td>LIBS 1110</td>
<td>RS 100</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>World Religions</td>
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<td></td>
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<td></td>
<td>LIBS 1170</td>
<td>SCI 237</td>
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<tr>
<td></td>
<td>Introduction to Astronomy</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>LIBS 1180</td>
<td>PSCI 150</td>
<td>0.50</td>
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<tr>
<td></td>
<td>Issues in World Affairs</td>
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<td></td>
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<tr>
<td></td>
<td>LIBS 1420</td>
<td>PSCI 260</td>
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<tr>
<td></td>
<td>Issues in Canadian Politics</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>LIBS 1500</td>
<td>VCULT 1XX</td>
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<tr>
<td></td>
<td>Aesthetics and Visual Cultures</td>
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<tr>
<td></td>
<td>LIBS 1650</td>
<td>PHIL 1XX</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>Quest for Wisdom</td>
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<tr>
<td></td>
<td>LIBS 1660</td>
<td>PHIL 1XX</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>Viewing Philosophy Through Film</td>
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<tr>
<td></td>
<td>LIBS 1690</td>
<td>PSYCH 238</td>
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</tr>
<tr>
<td></td>
<td>Applied Organizational Behaviour</td>
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<td></td>
<td>LIBS 1910</td>
<td>SCI 2XX</td>
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<tr>
<td></td>
<td>Environmental Science</td>
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<td></td>
<td>PSYC 1090</td>
<td>PSYCH 1XX</td>
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<td></td>
<td>Sociology I</td>
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<tr>
<td></td>
<td>LIBERAL STUDIES ELECTIVE COURSE UNITS TRANSFERRED:</td>
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<td></td>
<td>TOTAL UNITS TRANSFERRED:</td>
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<td>9.00</td>
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<td>UP TO</td>
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</tbody>
</table>

Other liberal studies elective courses offered by Conestoga may be assessed and awarded for transfer by the University of Waterloo and are not limited to those assessed and listed in the chart above. Up to 5.0 units of liberal studies elective courses may be awarded into the Arts program at Waterloo.

The transfer credit assessment outlined in the chart above applies only to the pathway articulated in this Agreement. If students transfer to another plan at Waterloo, admission and transfer credits will be re-assessed and transfer credits may be reduced.

Transfer credit requirements:
Transfer credits, up to a maximum of 9.0 units, will be awarded for courses (listed above) in which a minimum grade of B- (70%) has been achieved.

**Credits that must be achieved at the receiving organization:**

Credits are as outlined by the Faculty of Arts graduation requirements at Waterloo. All Faculty of Arts 4-year degrees require a minimum of 40 courses of 0.5 unit credit weight, for a total of 20 units.

**Credential(s) to be granted on successful completion of all required components:**

- Honours Bachelor of Arts (4 year program)

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**Article IV**

**Communication and Marketing**

**Communication**

The Chair of the School of Liberal Studies at Conestoga shall be responsible for the ongoing communication and monitoring of the Agreement at Conestoga. Waterloo will designate an individual responsible for this Agreement at Waterloo.

These individuals will work together to develop marketing and recruitment strategies for this Agreement. Furthermore, the two individuals will co-ordinate annual pathway reviews.

**Positioning**

Opportunities pursuant to this Agreement will be advertised in the respective University and College promotional materials. Conestoga and Waterloo will exchange, where applicable, such items as marketing publications, academic calendars, student guides, housing information, course outlines, and/or research materials.

Each party will obtain the other’s consent before issuing any official media releases and/or marketing or promotional materials relating to this Agreement and/or incorporating the other party’s name or logo(s).

Conestoga agrees to inform its students of this Agreement in order to provide opportunity for eligible graduates of the GAS program to apply to the Arts program and apply for transfer of credit. Conestoga agrees to set aside class time for promotion of this Agreement during the winter term of the first and second years of the GAS program.
Signatories

This Agreement is effective upon signature of all parties. The signatories hereby warrant that they have express and sufficient authority to execute this Agreement on behalf of the institutions on whose behalf they have signed.

For University of Waterloo

Dr. D. George Dixon  
Interim Vice-President Academic & Provost  
University of Waterloo  
I have authority to bind the Corporation.

Dr. Douglas Peers  
Dean of Arts  
University of Waterloo  
I have authority to bind the Corporation.

For Conestoga College ITAL

Dr. Barbara Kelly  
Vice President, Academic Administration  
Conestoga College ITAL  
I have authority to bind the Corporation.

Rusty McLay  
Chief Administrative Officer and General Counsel  
Conestoga College ITAL  
I have authority to bind the Corporation.
Major Awards

Social Sciences and Humanities Research Council (SSHRC) recently launched a new program within their Connection family of grants: Partnership Engage grants. These grants provide short-term support, of up to $25,000 for one year, to partnerships between academic researchers and public/private/non-profit sector partners. Two researchers from Waterloo submitted to the first competition, held in September 2017, and both were successful. Dr. Paul Parker, from School of Environment, Enterprise and Development (SEED) will receive $24,819 for his proposal ‘Renewable energy in community sustainability initiatives: NunatuKavut Labrador’ and Dr. Arshi Shaikh, from Renison, will receive $22,168 for her proposal ‘Supportive housing of Waterloo SHOW: an innovative model to address persistent homelessness’. The national success rate for this first competition was 50.5%. This program will be offered 4 times per year and proposals are already underway for the next competition in December.

The Networks of Centres of Excellence of Canada initiated a call this Fall, open to new and renewal NCE proposals. A total of three Letters of Intent were submitted in which University of Waterloo was identified as the proposed host institution. Results of the LOI are expected in February, with a full application due in July 2018. This competition expects to fund 3 new and/or renewal Networks of Centres of Excellence (NCE) applications.

The Ontario Research Fund – Large Infrastructure Fund (ORF-LIF) program provides co-funding to the Canada Foundation for Innovation – Innovation Fund (CFI-IF) program (at 40% of the budgets originating from the Province of Ontario). The purpose of the ORF-LIF is to help cover the costs of building/renovating and equipping facilities to conduct collaborative academic research. In total, 10 of 23 applications were awarded (43.5% application success rate); and $13,014,375 was awarded from a total requested amount of $37,474,270 (34.7% funding rate). All of the ORF-LIF awarded projects received the full requested amount.

The information below highlights the awarded applications and the funded amounts:
- Adrian Gerlich #36201 - $1,925,191 CFI / $1,925,191 ORF
- Ehsan Toyserkani #36245 - $7,023,813 CFI / $2,275,417 ORF*
- Steven Waslander #36372 - $1,934,865 CFI / $1,934,865 ORF
- William Wong #36474 - $2,852,298 CFI / $2,852,298 ORF
- Michael Worswick #36486 - $861,091 CFI / $861,091 ORF
- Richard Kelly #36259 - $493,158 CFI / $493,158 ORF
- Jonathan Price #36402 - $1,083,524 CFI / $1,083,524 ORF
- Kyung Choi #36255 - $960,000 CFI / $960,000 ORF
- Thomas Jennewein #36264 - $338,601 CFI / $338,601 ORF
- Joe Sanderson #36436 - Provincial Lead = $290,230 ORF**

*Note: Ehsan Toyserkani’s CFI-IF application involved three institutions that received separate provincial funding (Dalhousie/Nova Scotia; McGill/Quebec; and UBC/British Columbia funding).
** Note: Joe Sanderson was involved in an L’Institut national de la recherche scientifique (INRS) CFI-IF project (Québec) where he was assigned the role of the Ontario lead.
Research Partnerships

The Office of Research has concluded negotiations to create the Cisco Research Chair in 5G Systems for Professor Catherine Rosenberg of Electrical and Computer Engineering. It is intended that Cisco’s investment of $1 million will subsequently be leveraged by NSERC to create total research activity of > $2 million.

A Memorandum of understanding (MOU) has been put in place between The Games Institute (Professor Neil Randall) and Correctional Services Canada to fund up to $500,000 of new research. This is a significant initiative by the Games Institute to develop a creative research partnership.

Natural Sciences and Engineering Research Council of Canada (NSERC) Site review completed for renewal of Professor Peter Huck’s (Civil Engineering) Industrial Research Chair in Water Treatment. The total value of the Chair exceeds $3.4 million over five years, including contribution from NSERC plus seventeen partners. If/when approved this would be the first ever NSERC Industrial Research Chair to be renewed for a sixth five-year term.

RBC has invested > $1.5 million in three Computer Science projects (Professors Boutaba, Goldberg, Jao) relating to various projects in data security, cryptography, and privacy.

Canada Research Chairs Program Equity Action Plan

As part of their response to their 15th Year Evaluation, the Canada Research Chairs (CRC) Program prioritized greater transparency and accountability in meeting equity targets for four main groups – women, visible minorities, people with disabilities, and Aboriginal (Indigenous) people. Accordingly, the University of Waterloo has developed and begun implementing a robust CRC Equity, Diversity, and Inclusion Action Plan to drive change in the CRC program, and allow us to meet and exceed our CRC equity targets by December 2019. The Equity Action Plan will be posted on our CRC Public Accountability website on December 15, 2017.
To: Senate

From: Jean Andrey, Dean
Faculty of Environment

Re: Proposed changes to the Constitution of the Faculty of Environment

Date: 15 January 2018

Motion: Pursuant to Section 15 of Senate Bylaw 1, that Senate approve the revised Constitution of the Faculty of Environment.

Rationale: The changes bring the Faculty’s constitution in line with other Faculty constitutions by updating the provisions relating to Faculty Council and its committees, including modifications to membership rules and procedures. A brief description of the changes follows.

In general, the changes are not substantive, and represent only a reformulation of the document to bring it in line with other Faculty Constitutions at the university. This document does not attempt to list all the changes, but rather to highlight the most notable ones:

- Membership of Faculty Council revised from two faculty members in the sub-units to include all professors, associate professors, assistant professors and lecturers holding a regular, full-time faculty appointment in the Faculty;
- Removal of General Assembly – met once a year for the purpose of reporting from the sub-units;
- Executive Committee is replaced by Administrative Committee to include student members with voting privileges;
- Quorum of Faculty Council changes from 50% of the membership to 20% of the membership as the revised constitution includes all regular, full-time faculty members.

Faculty of Environment Constitution consultation and approval process to date:

- 15 June 2017 – unanimous approval of unit heads and associate deans;
- 19 June 2017 – notification to all Environment faculty, staff and student leaders, requested feedback by 27 June 2017;
- 29 June 2017 – endorsed by Undergraduate Studies Committee;
- 26 July 2017 – endorsed by Graduate Studies Committee;
- 14 September 2017 – Faculty of Environment Executive Committee endorsed draft constitution;
- 28 September 2017 – Faculty of Environment Faculty Council – Faculty of Environment Faculty Council endorsed draft Constitution and agreed to recommend the Constitution to Senate
CONSTITUTION OF THE
FACULTY OF ENVIRONMENT
AT THE
UNIVERSITY OF WATERLOO

The Faculty of Environment at the University of Waterloo (the “University”) is constituted to (i) foster a collaborative community of engaged students, staff, faculty and alumni who are empowered and supported to contribute to impactful research that transcends disciplinary boundaries in addressing complex environmental and societal issues, (ii) build the University’s reputation as a national and global leader by offering a brand of unique and highly regarded educational programs related to environment and sustainability.

I

FACULTY AND FACULTY COUNCIL

I.1 There shall be a unit of the University called the Faculty of Environment (the “Faculty”).

I.2 The following departments and schools (called “Sub-Units” in the balance of this Constitution) shall form the Faculty: Department of Geography and Environmental Management; Department of Knowledge Integration; School of Environment, Enterprise and Development; School of Environment, Resources and Sustainability; School of Planning; and any such department or school as may be approved by the University and accepted by Faculty Council.

I.3 The plenary organ of the Faculty shall be the Faculty of Environment Faculty Council (“Faculty Council”).

I.3.i Faculty Council shall consist of the following, all as voting members:

a) Ex-officio from the University

The President of the University
The Vice-President, Academic & Provost
The Associate Vice-President, Academic
The Associate Vice-President, Graduate Studies and Postdoctoral Affairs
The University Registrar or delegate
The University Librarian or delegate
The Faculty Relations Manager (Environment) in the Department of Co-operative Education or delegate

b) From other Faculties

One representative from each of the other Faculties in the University

c) From the Faculty

Executive Officer
Director of Advancement of the Faculty  
Director of Computing of the Faculty  
two staff members elected from among all staff employed in the Faculty or any Sub-Unit  
President of the Faculty of Environment Student Society  
President of the Faculty of Environment Graduate Student Association or Association of Graduate Planners, for a one year term and alternating from year to year  
d) From each Sub-Unit  
All Professors, Associate Professors, Assistant Professors and Lecturers holding a regular, full-time faculty appointment in the Faculty  
One full-time graduate student from each Sub-Unit, chosen by their peers for a term of one year  
One full-time undergraduate student from each Sub-Unit, chosen by their peers for a term of one year  

I.3.ii Faculty Council may invite representatives of other units and sub-units of the University to attend and participate in meetings of Faculty Council on such terms as Faculty Council may determine.

I.4 Except as may otherwise be determined by Faculty Council, meetings of Faculty Council shall be open. However, only members of Faculty Council shall have the privilege of the floor or shall vote. Observers may be given the privilege of the floor at the discretion of the chair of the meeting. Faculty Council may, with reasonable advance notice, close a meeting to any or all categories of spectators. Student members of Faculty Council shall not participate in meetings or parts of meetings in which individual student cases are discussed.

I.5 Faculty Council shall meet at least four times annually, normally in September, November, January and March. Additional meetings may be held either at the call of the Administrative Committee, established pursuant to Clause III.1 below, or within 15 working days of receipt by either the Chair or the Secretary of Faculty Council of the written request of one of the following:  
- the Dean  
- the Chair of Faculty Council  
- a petition of 20% or more of any of  
  - faculty members with regular full-time appointments in the Faculty, or  
  - full-time staff in the Faculty, or  
  - full-time graduate students in the Faculty, or  
  - full-time undergraduate students in the Faculty.

I.6 A quorum at all meetings shall consist of 20% of Faculty Council members. For the purposes of identifying the members of Faculty Council so as to calculate quorum, *ex officio* members of Faculty Council representing the University as listed in paragraph I.3.i a) above, and representatives from other faculties as listed in paragraph I.3.i b) above, shall not be counted. Proxy votes shall not be permitted.
I.7 Meetings of Faculty Council shall be conducted in accordance with Roberts Rules of Order and Procedure (to the extent that those Rules are not inconsistent with this Constitution) and such bylaws as may be adopted by Faculty Council. Except as otherwise provided for in this Constitution, notices of meetings with agenda and all relevant documentation shall be circulated to members of Faculty Council at least 5 working days in advance of its meetings.

I.8.i Faculty Council shall have the following powers and duties:

a) Subject to the approval of the Senate of the University (the “Senate”), to determine the course of study in the Faculty and the conditions of admission into, and continuation within, these courses of study;

b) To appoint such standing and ad hoc committees of Faculty Council as it shall determine, and to delegate to such committees the powers and responsibilities that Faculty Council itself possesses; and

c) To consider and report to Senate upon such matters affecting the Faculty as Faculty Council may deem appropriate.

II OFFICERS

II.1 The Dean

II.1.1 The senior executive officer of the Faculty shall have the title "Dean of Environment" (the “Dean”).

II.1.ii The Dean is an officer of the University and is appointed in accordance with University Policy 45, The Dean of a Faculty, as it may be amended from time to time, or any document in substitution therefor.

II.1.iii In reporting to the Vice-President, Academic & Provost, the Dean leads the Faculty with respect to curriculum development, teaching, learning, research, and fostering its best interests. The Dean represents the Faculty and acts on its behalf in any administrative and ceremonial matters pertaining to the Faculty as a whole. The Dean manages the Faculty, including matters relating to resourcing, resource allocation and Faculty development with advice from the Faculty Council and other relevant committees and performs such other duties or functions as required for the academic program of the Faculty.

II.1.iv On the recommendation of the Administrative Committee established pursuant to Clause III.1 below, the Dean has the authority to submit names to the Senate Honorary Degrees Committee for the awarding of honorary degrees and for distinguished professor emeritus appointments.

II.2 The Chair of Faculty Council

II.2.i The Chair shall be appointed, in rotation, by Faculty Council from among each of the Sub-Units for a one year term. Only members of Faculty Council holding a regular, full-time faculty appointment in the Faculty shall be eligible to be appointed as Chair. The
Chair/Director of the relevant Sub-Unit shall be responsible for submitting a name for consideration by Faculty Council to the last meeting of the Faculty Council in the year before the term is to commence. If, however, the incumbent Faculty Council Chair is willing, and Faculty Council is in favour, a second term may be served.

II.2.ii The duties of the Chair shall consist of:

a) Calling and chairing meetings of Faculty Council in accordance with Clause I.5 above; and
b) Such other duties as may be assigned to the Chair by this Constitution or through bylaws or resolutions of Faculty Council.

II.3 The Secretary of Faculty Council

II.3.i The Faculty Services Manager & Executive Assistant shall serve as secretary of Faculty Council.

II.3.ii The duties of the secretary shall consist of:

a) Giving notice of and recording the proceedings of Faculty Council meetings and keeping the attendance roll;
b) Giving notice of and recording proceedings of meetings of the Administrative Committee established pursuant to Clause III.1 below; and
c) Such other duties as may be assigned to the secretary by this Constitution or through bylaws or resolutions of Faculty Council.

III

STANDING COMMITTEES

III.0 Quorum

Unless otherwise established by resolution of Faculty Council, the quorum for the proper conduct of business at a meeting of any of the standing committees established by Faculty Council, including the standing committees referred to in this Constitution, shall be a majority of the members of such committee, present either in person, by telephone or by teleconference.

III.1 Administrative Committee (the “AC”)

III.1.i The AC shall:

a) Plan the forthcoming business of Faculty Council and arrange the agenda of its meetings;
b) Act on behalf of Faculty Council between meetings of Faculty Council;
c) Receive reports from standing and ad hoc committees of Faculty Council;
d) Assign matters to appropriate committees of Faculty Council and manage matters that do not otherwise fall within the mandates of committees of Faculty Council;
e) Report all decisions taken by the AC under paragraph III.1.i.b) above to Faculty Council at the next meeting of Faculty Council.

III.1.i. The AC may consider any questions related to the guidelines, administration, or general well-being of the Faculty. Recommendations arising as a result of any such considerations shall be sent by the AC to Faculty Council for consideration.

III.1.ii The AC shall consist of the following members, all of whom shall be voting members unless otherwise noted:

a) Dean, who shall be Chair;
b) Associate Deans;
c) Chair or Director of each Sub-Unit;
d) Chair of the Faculty Council;
e) Secretary of Faculty Council (non-voting);
f) President of the Faculty of Environment Students Society;
g) President of the Faculty of Environment Graduate Student Association or Association of Graduate Planners, for a one year term and alternating from year to year;
h) Executive Officer of the Faculty;
i) the two elected staff members referred to in paragraph I.1.i.c) above;
j) Director of Advancement of the Faculty; and
k) Director of Computing of the Faculty.

III.1.iii The secretary of Faculty Council shall act as secretary of the AC. Meetings of the AC shall be closed to everyone other than members of AC and those invited to attend at the request of the AC. A simple majority of the voting members shall constitute quorum.

III.1.iv Meetings of the AC will normally take place in advance of each meeting of Faculty Council for the purpose of setting the agenda for meetings of Faculty Council. Other meetings of AC will be held as required to allow it to execute its responsibilities.

III.2 Undergraduate Studies Committee (the “UGSC”)

III.2.i Subject always as required to the approval of Senate, Senate committees, Senate councils and other bodies and offices with mandated responsibility for development and operation of undergraduate studies at the University, the UGSC shall:

a) Provide general academic oversight on proposals concerning curricula, courses, academic policies, academic standards, continuation conditions, and general undergraduate affairs, and make recommendations on those matters to Faculty Council;
b) Define and oversee the functioning of the core curriculum in the Faculty, and make recommendations in that respect to Faculty Council;
c) Establish and oversee policies relating to admission of undergraduates to the Faculty, including policies governing advanced standing;
d) Oversee and coordinate the preparation of calendar and other informational material relating to undergraduate programs and plans in the Faculty;
e) Implement existing policies concerning examination results, standings, promotions, withdrawals, and related matters; and
f) Consult representatives of groups that do not have permanent representation on the UGSC whenever those groups may be affected by proposals to be considered by the UGSC, and, in the discretion of the UGSC, invite representatives of such groups to attend UGSC meetings at which such proposals are to be discussed.

III.2.ii The UGSC shall consist of the following as members, all of whom shall be voting members of the UGSC unless otherwise noted:

(a) the Associate Dean, Undergraduate Studies;
(b) the Assistant Registrar, Environment or delegate;
(c) one faculty member representing each Sub-Unit;
(d) the President of the Environment Students Society;
(e) one student representative of each Sub-Unit (non-voting);
(f) one undergraduate advisor representing each Sub-Unit, who may vote only on non-academic matters;
(g) one representative of the Department of Co-operative Education; and
(h) the Faculty Undergraduate Co-ordinator, who may vote only on non-academic matters.

III.2.iii The chair of the UGSC shall be the Associate Dean, Undergraduate Studies and the secretary of the UGSC shall be the Assistant to the Associate Dean, Undergraduate Studies. Meetings of the UGSC shall be closed to everyone other than members of the UGSC and those invited to attend at the request of the UGSC. Meetings of the UGSC shall be held at the call of the Chair.

III.2.iv Except as otherwise provided in this Article III.2, the recommendations of the UGSC shall be referred to Faculty Council for consideration.

III.2.v The Faculty Council may, by resolution, delegate to the UGSC the responsibility for decision on any specific question or issue relating to undergraduate studies, including matters of academic discipline and grade or standing appeals.

III.3 Graduate Studies Committee (the “GSC”)

III.3.i Subject always as required to the approval of Senate, Senate committee, Senate councils and other bodies and offices with mandated responsibility for development and operation of graduate studies at the University, the GSC shall:

a) Be responsible for the development and operation of graduate studies in the Faculty, and make recommendations on those matters where required to Faculty Council;
b) Consider all proposed new graduate courses and programs and all proposed changes in existing graduate courses and programs, and to make recommendations to Faculty Council in those respects;
c) Ensure the requirements for minimum qualifications as approved doctoral dissertation supervisors within the Faculty are met;
d) Approve the committees for doctoral thesis examinations;
e) Oversee the preparation of calendar and other informational material related to the graduate programs of the Faculty, and to coordinate such material prepared by Sub-Units;
f) Make recommendations to the appropriate bodies on the financial requirements for graduate student support; and

g) Have responsibility for the admissions policies and procedures for graduate students, subject to approval by Faculty Council.

III.3.ii The GSC shall consist of the following as members, all of whom shall be voting members of the GSC unless otherwise noted:

(a) the Associate Dean, Graduate Studies;
(b) one faculty member representing each Sub-Unit with graduate programs;
(c) all graduate program assistants representing graduate programs in the Faculty, who may vote only on non-academic matters;
(d) one graduate student representative from each Sub-Unit, each of whom shall be non-voting;
(e) one graduate student representing each of the Faculty of Environment Graduate Student Association and the Association of Graduate Planners, each of whom shall be non-voting; and
(f) the Assistant to the Associate Dean, Graduate Studies, who may vote whenever non-academic matters are involved.

III.3.iii The chair of the GSC shall be the Associate Dean, Graduate Studies, and the secretary of the GSC shall be the Assistant to the Associate Dean, Graduate Studies. Meetings of the GSC shall be closed to everyone other than members of the GSC and those invited to attend at the request of the GSC. Meetings of the GSC shall be held at the call of the Chair.

III.3.iv Except as may otherwise be provided in this Article III.3, the recommendations of the GSC shall be referred to Faculty Council for consideration.

III.3.v The Faculty Council may, by resolution, delegate to the GSC the responsibility for decisions on any specific question or issue relating to graduate studies.

III.4 Faculty Tenure and Promotion Committee (the “FTPC”)

III.4.i The FTPC shall serve as the faculty tenure and promotion committee as outlined in University Policy #77, Tenure and Promotion of Faculty Members (“Policy 77”).

III.4.ii Membership on the FTPC shall be as provided for faculty tenure and promotion committees in Policy 77.

III.5 Faculty Committee on Student Appeals (the “FCSA”)

III.5.i The FCSA shall:

a) Exercise the jurisdiction vested in faculty committees on student appeals by section 3 of University Policy 72, Student Appeals (“Policy 72”); and

b) Advise Faculty Council on matters referred to in paragraph III.5.i.a) as appropriate.

III.5.ii The FCSA shall consist of the following as members:
a) the Chair;
b) the Secretary;
c) one faculty member to be selected by the Dean from a Sub-Unit on a case-by-case basis; and
d) one full-time graduate or undergraduate student in the Faculty, selected by the FCSA Chair from recommendations made by the President of the Faculty of Environment Graduate Student Association or by the President of the Faculty of Environment Student Society, and determined on a case-by-case basis.

III.5.iii The chair of the FCSA shall be appointed by the Dean (for a term of at least two years) from among regular full-time faculty members in the Faculty. Meetings of the FCSA shall be closed to everyone other than members of the FCSA and those invited to attend at the request of the FCSA.

III.5.iv The Faculty Services Manager & Executive Assistant shall serve as secretary of FCSA

III.5.v If any provision of this Clause III.5 is inconsistent with or contradictory to the provisions of Policy 72, then the provisions of Policy 72 shall prevail.

IV

AD HOC COMMITTEES

IV.1.i Faculty Council shall be entitled to establish such other standing or ad hoc committees as it sees fit, to determine the composition and terms of reference of such committees, and to appoint the initial members of such committees, provided that:

a) no such committee shall remain a committee of Faculty Council for more than two years from the date of the meeting of Faculty Council at which it was established unless its composition and terms of reference are incorporated in this Constitution.

IV.2 Quorum

Unless otherwise established by resolution of Faculty Council, the quorum for the proper conduct of business at a meeting of any ad hoc committee established by Faculty Council pursuant to this Constitution shall be a majority of the members of such committee, present either in person, by telephone or by teleconference.

V

VACANCIES

V.1 Vacancies on Committees of Faculty Council

V.1.i Should the office of chair or secretary (as the case may be) of Faculty Council become vacant for any reason whatsoever, then the remaining members of the AC shall appoint a faculty member of Faculty Council to serve in that office until a replacement is identified in
accordance with the provisions of sub-Clause V.1.i. Normally, any replacement chair shall be selected from the Sub-Unit from which the former chair was selected, and shall serve as chair for the balance of the term of the former chair.

V.1.ii Any elected member of a committee of Faculty Council shall be deemed to have vacated the position should the incumbent be absent from the University for longer than six consecutive months.

V.1.iii Should a vacancy occur for any reason whatsoever in any elected position on a committee of Faculty Council, then the remaining members of that committee shall appoint another member to serve in that position until a replacement is identified in accordance with the provisions of this Constitution by which the relevant committee is established.

VI

BYLAWS AND CONSTITUTIONAL AMENDMENTS

VI.1 Bylaws of Faculty Council shall be adopted by a simple majority of the votes cast at a duly constituted meeting of Faculty Council at which a quorum is present. Notice of proposed amendment, repeal or adoption of bylaws must be given in writing not less than 30 days prior to the meeting at which those proposals are intended to be considered.

VI.2 Subject to approval of Senate, this Constitution may be adopted or amended by a vote of 2/3 of the votes cast at a regularly scheduled meeting of Faculty Council at which a quorum is present. Notice of proposed constitutional amendments must be given in writing not less than 30 days prior to the meeting at which those proposals are intended to be considered.

Approved at a meeting of Faculty Council held **** 2017.
Approved at a meeting of Senate held **** 2018.